

Appendix G

Heavy Rail Technical Memorandum and Powerpoint Presentation to the Red Line Citizen's Advisory Committee, February 2008

**BALTIMORE REGIONAL
TRANSIT SYSTEM**

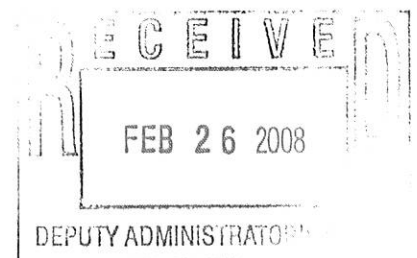


RED LINE CORRIDOR TRANSIT STUDY

**Technical Memorandum
Heavy Rail Alternative - TRAC**

February 2008

Prepared for:
Maryland Transit Administration



INTRODUCTION

Heavy rail transit (HRT) alternatives for the Red Line corridor, using the same or similar technology as the existing Baltimore Metro, have been suggested by several individuals, groups, or agencies since the beginning of the project. Early analyses of the feasibility of a heavy rail alternative showed that the ridership required to make heavy rail technology cost effective is much higher than can be expected in the Red Line corridor, requiring over 100,000 daily boardings¹. Ridership forecasts were not developed at the start or during the scoping phase of the project, but a light rail transit (LRT) tunnel option between Security Square Mall and Patterson Park examined by the Baltimore Metropolitan Council (BMC) estimated only 35,000-40,000 daily passenger trips for an alignment with a high construction cost of over \$2.0 billion. For that reason, and because of FTA's strict adherence that projects meet a "medium" cost-effectiveness threshold for federal funding eligibility, heavy rail was dropped from consideration in the Red Line study.

Now that updates have been made to the BMC travel demand model and tested with the Red Line LRT and bus rapid transit (BRT) alternatives, the MTA decided to look at a heavy rail alternative again in response to continued public requests. The specific purpose of this study is to determine the cost, ridership, and cost effectiveness of an additional heavy rail alternative provided by Mr. Ed Cohen on behalf of the Transit Riders Action Council.

ALIGNMENT

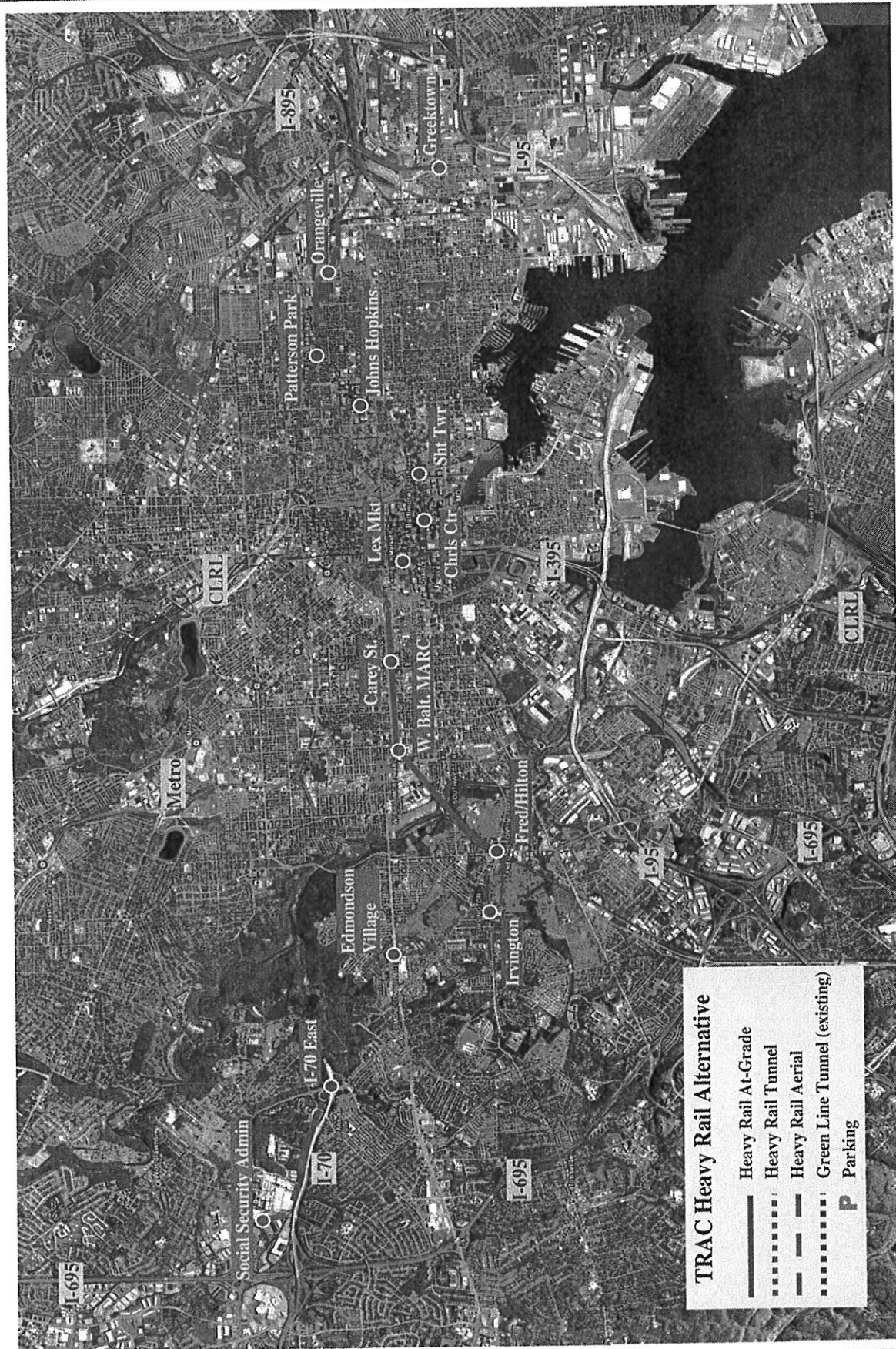
The alignment studied to test a heavy rail option was one proposed by Transit Riders Action Council (TRAC), slightly modified to terminate at Bayview rather than the Travel Plaza station 1.2 miles to the south. This modification was made so that this heavy rail alternative serves the same general market as the ten Build alternatives for the Red Line Corridor Transit Study.

As shown in Figure 1, the alignment begins from a western terminus at Social Security Administration, extends southeast to Frederick Road, northeast along Amtrak, and within the depressed section of US 40 to join the existing Metro tunnel north of the Lexington Market station. Red Line HRT trains would share the existing tunnel between the connection through downtown to Johns Hopkins station. From the Johns Hopkins station the Red Line HRT alignment continues north, turns to the east to parallel the Amtrak corridor, then turns south near Bayview to Eastern Avenue.

¹ For purpose of comparison, the 5 Washington Metro lines are each averaging 150,000 passenger trips per weekday.

Table of Contents

INTRODUCTION	1
ALIGNMENT	1
STATIONS	3
ENGINEERING.....	3
ALIGNMENT ISSUES	4
CAPITAL COST ESTIMATES	5
OPERATIONS	6
TRAVEL TIME.....	6
HEADWAYS	7
VEHICLE REQUIREMENTS	7
FEEDER BUS	8
OPERATING AND MAINTENANCE COSTS	9
TRAVEL DEMAND ESTIMATES.....	9
SPECIAL GENERATOR TRIPS	10
USER BENEFIT SUMMARY	10
COST EFFECTIVENESS	11
APPENDIX A: CAPITAL COST DETAIL.....	13



Stations

Ten new stations are included in this alternative. With the four shared stations in the existing tunnel – at Lexington Market, Charles Center, Shot Tower, and Johns Hopkins – the Red Line HRT alignment would have the same number of stations as the existing Metro line. Table 1 lists the stations, facilities, and connecting transit services. New parking facilities are proposed at I-70 East, Irvington, Fred/Hilton, Orangeville, and Bayview stations.

Table 1
Proposed Station Facilities

Stations	Location	Park & Ride	Kiss and Ride	Connecting Transit Service
SSA	Woodlawn Drive at SSA	No	Yes	M6, 15, 40, 44, 77 Extend 10 to SSM and SSA
I-70 East	I-70 terminus at Security Blvd.	Yes	Yes	15A, 40 (B2 from Howard Co)
Edmondson Village	US 40 near Athol Ave.	No	Yes	20, 23, 26, 40, and 150
Irvington	Frederick Ave. near Loudon Ave.	Yes	Yes	10
Fred Hilton	Frederick Ave. at Hilton St.	Yes	Yes	10, 16, 20, 35, 320, 329
West Baltimore MARC	US 40 west of Pulaski St.	Exist	Yes	MARC, 15, 23, 40, 51
Carey Street	US 40 at Carey St.	No	On street	Route 1
Lexington Market	(Existing)	No	No	CLRL, 5, 7, 10, 11, 19, 23, 27, 40, 91
Charles Center	(Existing)	No	No	Metro, 1, 3, 7, 8, 10, 11, 20, 23, 36, 61, and 64
Shot Tower	(Existing)	No	No	Metro, 20, 23, 40
Johns Hopkins	(Existing)	No	On-street	5, 35, 120
Patterson Park	Amtrak near Milton Ave.	No	On-street	5, 13
Orangeville	E. Monument St. west of Haven St.	Yes	Yes	22, 24, 29, 33, 35, 44, 120
Greektown/Bayview	Eastern Ave. east of I-895	Yes	Yes	10, 12, 20, 23, 40, 160, 410, 411, 412, 420

Engineering

The engineering effort focused on determining the location of the alignment, which portions of the alignment could be at-grade and which would have to be on aerial structure or in tunnel to avoid community impacts, and feasible locations of any major facilities such as a storage yard and connections to the existing Metro tunnel downtown. These determinations were used to develop the capital cost estimates.

The engineering analysis consisted of plotting the proposed alignment on aerial photography obtained for the Red Line study and locating the alignment in CAD using the same general design criteria as the existing Metro. From that analysis, the following guideway types were determined to be the most feasible:

- Aerial structure from Social Security Administration station to parallel to I-70.
- At-grade from parallel to I-70 to west of I-70 East station and Security Boulevard.
- Tunnel from west of I-70 East station under Leakin Park, Edmondson Village, Old Frederick Road, and Loudon Park Cemetery to the Fred/Hilton station, which would be located in a depressed section under Hilton Street and Frederick Avenue. I-70 East, Edmondson Avenue, and Irvington stations would be underground.
- At-grade on fill or retained fill adjacent to the Amtrak ROW from the Fred/Hilton station to US 40 then aerial structure to the depressed portion of US 40 east of Pulaski Street.
- At-grade in the median of US 40 to a tunnel portal west of MLK Boulevard and then underground to a connection with the existing Metro tunnel north of Lexington Market.
- Tunnel from a new pocket track constructed at the tail tracks² north of Johns Hopkins station to a portal parallel to the Amtrak ROW near Milton Avenue. Patterson Park station would be underground.
- At-grade on fill or retained fill along Amtrak to the Orangeville station.
- Aerial structure from east of the Orangeville station to the Greentown/Bayview station, which will likely be on aerial structure for its possible future extension to the southeast.

Alignment Issues

Because the primary intent of this study is to determine the cost-effectiveness of a heavy rail alternative, a cursory examination of the physical challenges of constructing a heavy rail alignment was undertaken. Several observations and assumptions include, from west to east:

- No parking is assumed at Social Security Administration station because of concerns expressed by SSA. The station is served by several bus routes.
- The tunnel section between I-70 East station and Edmondson Village is mostly under Leakin Park. The length of the tunnel segment will likely require vent shafts in the park. The limitations and required avoidance measures of any construction within the park associated with 4(f) and other federal and state regulations have not been studied.
- Edmondson Village station is assumed to not have parking because the Uplands development plans would require most of the existing parking lot.
- Fred-Hilton station may be difficult to site and to provide appropriate access. The station would be depressed in a cut under several roads that converge in this area.

² Tail tracks are short sections (600 – 1000') of track extending beyond a terminal station used both for storage of trains as well as a safety measure for trains entering the station.

- The heavy rail alignment along the Amtrak ROW requires moving the W. Baltimore MARC station south to a location along the tangent section of the Amtrak ROW. The costs of moving the MARC station are not included in the cost estimates.
- The connection to the existing Metro tunnel north of Lexington Market requires approximately 1000 feet of cut-and-cover construction along the existing tunnel and extending to the west along the new tunnel. The connection assumes an at-grade junction to reduce costs.
- The construction of the junction will require the existing Metro to be shut down for a minimum of 6 to 9 months while the new tunnel is cut in and connecting tracks and related signal equipment installed and tested. During that time, a bus bridge would be needed to transport commuters between State Center and Johns Hopkins stations. The cost of the bus bridge is not included in the cost estimate.
- The alignment uses the existing Metro tunnel from between the connection north of Lexington Market station to Johns Hopkins station. There are, therefore, no new stations downtown.
- The availability of ROW along the Amtrak corridor near W. Baltimore MARC station on the west side and near the Orangeville station on the east side was not field verified. Some property takes may be required in these areas.
- Feasibility of the alignment based on visual inspection of aerial photographs. No mapping or property boundaries were used.
- There are limited Transit-Oriented Development opportunities with the proposed stations. FTA considers transit supportive land use policies or plans a major factor in the project justification criteria rating for New Starts projects.
- There may be unknown environmental issues along the alignment; no environmental work was performed in this study.

Capital Cost Estimates

Capital cost estimates were developed using the same general methodology as was used for Red Line alternatives, substituting heavy rail unit costs. Heavy rail unit costs were used derived from experience with comparable systems. Typical construction types were used throughout the alignment. Additional assumptions include:

- Two track guideway of similar design criteria as existing Metro.
- Stations with 450 foot long platforms to accommodate six-car consists, similar to existing Metro. Station size and facilities similar to existing Metro.
- A flat junction (same level) connecting the Red Line HRT with the existing Metro tunnel north of Lexington Market station.
- Addition of a pocket track on the north side of Johns Hopkins station to allow the existing Green Line service to continue to turn-back there without interference to Red Line HRT trains.

- Right-of-Way costs equivalent to Red Line Alternative 4D, with extensive grade separation.
- Assumes the same car as existing Metro. Existing Metro fleet has 34 extra vehicles beyond what they need for revenue service and spares. The cost estimates for this study assume those 34 cars from existing fleet will be used on Red Line HRT.
- Total Red Line HRT needs fleet of 66 cars, so an additional 32 cars are included in cost estimate.
- Assumes a storage yard for 66 vehicles and space for inspection and maintenance. All heavy vehicle repair is assumed to take place at the existing Metro shops on Wabash Ave.

Table 2 summarizes the capital cost estimates. Appendix A provides backup to the capital cost estimates. Total preliminary cost estimate to construct the heavy rail line is \$2.4 billion in current dollars.

Table 2
Red Line HRT Capital Cost Estimates
(2007 Dollars in Millions)

Description		Heavy Rail Option
Length (Mile):		12 new
Number of Stations:		10 new
Number of Revenue Vehicles:		32 additional
10	GUIDEWAY & TRACK ELEMENTS	\$721.83
20	STATIONS, STOPS, TERMINALS, INTERMODAL	\$556.30
30	SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	\$35.00
40	SITWORK & SPECIAL CONDITIONS	\$132.34
50	SYSTEMS	\$140.49
		\$1,585.95
60	ROW, LAND, EXISTING IMPROVEMENTS	\$41.37
70	VEHICLES	\$134.74
80	PROFESSIONAL SERVICES	\$507.51
90	UNALLOCATED CONTINGENCY	\$113.48
		\$2,383.05

OPERATIONS

Travel Time

End to end travel times were estimated using detailed alignment geometry, station locations, and typical acceleration and deceleration rates. Table 3 summarizes the station to station travel times. The average speed for the 12 mile line is estimated at nearly 31 mph with dwells, the same average speed as the existing Metro.

Table 3
Heavy Rail Station-Station Travel Times

Station	Distance	Time	Ave Speed
SSA Station			
I-70 Station	8,952 ft	02:39	38.47
Edmondson Village	7,170 ft	02:26	33.53
Irvington Station	4,964 ft	01:58	28.77
Fred/Hilton Station	4,108 ft	01:45	26.57
W. Baltimore MARC Station	10,710 ft	03:39	33.31
Harlem Park Station	4,672 ft	01:50	28.85
Lexington Market Station	6,951 ft	02:34	30.75
Charles Center Station	2,742 ft	01:23	22.42
Shot Tower Station	2,288 ft	01:16	20.62
Johns Hopkins Station	4,906 ft	02:00	27.81
Patterson Park Station	3,057 ft	01:30	23.15
Orangeville Station	4,972 ft	01:53	29.90
Bayview Station	10,155 ft	03:03	37.80
One Way Total	75,647 ft	25:57	30.75

With an 8 minute recovery time at both termini, the cycle time for a complete run from one end to the other and back is 68 minutes.

Headways

Headways (time between trains in the same direction) are a function of passenger demand, desired frequency, and consist size. The existing Metro operates 6-car trains at 8-minute headways during the peak periods and 4-car trains at 10-min headways during the midday period. Trains operating during peak periods experience full passenger loading with some standees but not heavy loads requiring more frequent service.

Headways on the Red Line HRT should match those of the existing Metro because they share a portion of the tunnel through downtown. Matching headways helps even out passenger volumes on platforms and minimize delays from conflicting train movements at the junctions. For this exercise, headways on the Red Line HRT are assumed to be 8 minutes in the peak period and 10 minutes in the off-peak period.

Vehicle Requirements

Vehicle requirements are a function of headways, cycle time, and the train consist size necessary to meet the passenger demand. Cycle time is the time to make a complete cycle of the line and be ready for another run, including recovery time at both terminal stations to allow the operator to change ends and perform a brake test. The cycle time for the proposed TRAC heavy rail line is 68 minutes. Assuming an 8 minute headway, nine trains are required to operate the service, the same number of trains as the existing Metro line. With 6-car consists, 54 cars are required to operate revenue service in the peak period. With a 20 percent spare ratio, a total of 66 cars are required for the HRT fleet.

The existing Metro has an extra 34 cars from the original order that is beyond the customary 20 percent spare ratio. The cost estimates for this study assume the need to purchase only 32 additional cars to complete the fleet, a saving of more than \$76 million.

Feeder Bus

Several modifications to the feeder bus/background bus network were made as appropriate to serve the proposed stations. Table 4 lists new bus routes that were added and modifications to existing routes.

Table 4
Bus Route Modifications

Route	Station Served	Modification
B2	I-70 East	New express route from Marriottsville Rd PnR via I-70
6	Orangeville	New route from White Marsh to Orangeville station
10	SSA	Extended from US 40 north via Rolling Road to Security Square Mall and SSA
12	Bayview	New route from Iverness (Dundalk) to Bayview station
15	Johns Hopkins	Split existing route to have half serve Johns Hopkins on way to CBD
15A	I-70 East	New route to Rutherford Business Park via Windsor Mill Rd (same as Red Line alternatives)
HT15	Orangeville	New route from Bel Air Mall via US 1 to Orangeville station
20	Irvington	Rerouted down to Frederick Rd then back to Baltimore St.
23	Edmondson Ave	Extended through Ellicott City to Normandy Shop Center on US 40
24	Orangeville	Reroute to via Pulaski Hwy to Orangeville station
26	Edmondson Ave	New local route from Marriottsville Rd via US 40
29	Orangeville	New route from Fox Ridge via Pulaski Hwy to Orangeville station
33	Orangeville	Extended via Pulaski Hwy to Orangeville station
35	Fred/Hilton	Short reroute up Hilton Pkwy to Fred/Hilton; also extended to UMBC Tech Center
44	Orangeville	Reroute to serve station
160	Bayview	Reroute via Eastern Ave. to Bayview station
320	Fred/Hilton	New route from Laurel to Fred/Hilton station
329	Fred/Hilton	New route from Columbia to Fred/Hilton station
410	Bayview	Reroute via Eastern Ave. to Bayview station
411	Bayview	Reroute via Eastern Ave. to Bayview station
412	Bayview	Reroute via Eastern Ave. to Bayview station
420	Bayview	Reroute via Eastern Ave. to Bayview station

Existing routes comprise MTA's service as of March, 2007.

Operating and Maintenance Costs

Operating and maintenance costs were developed by estimating the HRT costs and adjusting for the change in the feeder/background bus network. Travel time, headways, and consist size for the TRAC Red Line HRT is nearly identical to the existing Metro; therefore the Red Line HRT operating costs are also expected to be the same: approximately \$43 million per year.

Assumptions:

Criteria	Metro	Red Line HRT
Distance (miles)	15.5	14.3
Stations	14	14 (10 new)
Daily Ridership	54,000	43,000 (in 2030)
Travel Time (min)	30	26
Cycle Time (min)	72	68
Headways	8 min peak period; 10 min off-peak; 15 min evening	
Consist	6-car trains in peak period; 4-car trains in off-peak	

Because the alignment does not follow a specific radial corridor, few bus routes can be eliminated due to redundancy with the rail line. Additional bus routes were added as described above to provide service from outlying communities to nearby HRT stations. The operating costs for the additional feeder bus service are assumed to offset any reductions in costs from the elimination of parallel bus service or the shortening of bus routes to serve HRT stations.

TRAVEL DEMAND ESTIMATES

Ridership estimates for the HRT alternative were developed using the same travel demand model as was used for the Red Line alternatives. That model incorporates many updates to the BMC model to meet FTA guidelines and to achieve a better validation.

Table 5 summarizes the HRT boardings and new transit trips. Guideway Boardings include any boarding at any guideway station regardless if that boarding arrives at the station by walking, driving, or transferring from a feeder bus or other transit mode such as Metro, Central Light Rail Line, or MARC, and as such represents unlinked trips. New Transit Trips are those passenger trips that have switched from automobile to transit. These are new linked trips and are counted only once regardless of how many transit modes or segments the passenger might take to their destination. Table 6 lists daily boardings by station.

Table 5: Red Line Guideway Boardings and New Transit Trips

Total Daily Guideway Boardings	Annual Guideway Boardings	Daily New Transit Trips Vs NB	Annual New Transit Trips
43,100	12,930,000	14,690	4,407,000

Guideway Boardings and New Transit Trips include all trip purposes but do not include special events.

Table 6: Red Line HRT Station Boardings

Station	Total Daily Boardings
SSA	2,460
I-70	2,060
Edmondson Village	2,470
Invington	1,880
Fred/Hilton	2,930
W. Baltimore	3,990
Harlem Park	290
Lexington Market	6,890
Charles Center	5,490
Shot Tower	1,600
Johns Hopkins	2,700
Patterson Park	1,360
Orangeville	4,090
Bayview	4,890
Total	43,100

Special Generator Trips

In addition to transit trips for work, shopping, and other purposes included in the ridership estimates in Table 5, transit passenger trips are expected on the Red Line to and from sports games at the two downtown stadiums and other large events. These include Orioles and Ravens games, Artscape, July 4th and New Years fireworks displays, and other events where transit ridership has been traditionally high. The existing Central Light Rail Line carried approximately 600,000 passengers in 2007 to and from special events. This equates to about 2,000 trips on an average weekday, or 7.5 percent of the 27,000 average weekday boardings on light rail.

Based on that ratio, and accounting for the proximity of the HRT alignment to the stadiums, approximately 690,000 passenger trips are expected to take the HRT to special events in 2030.

User Benefit Summary

Table 7 provides an overview of the user benefit hours for each of the alternatives investigated. User benefits is a FTA required measure of travel time saved and is used in the cost-effectiveness calculation. User benefits include travel time saved by passengers who previously rode transit and now experience a faster ride because of the improvement and those passengers who have switched from taking the automobile to taking transit to their destination. User benefits are counted for any transit passenger in the region, including Baltimore City, Baltimore County, Anne Arundel, Carroll, Harford, and Howard counties, who experiences a change in trip travel time from the construction of the proposed improvement. FTA believes that the cost per hour of transportation system user benefits is a sound measure for cost effectiveness because it (1) captures the benefits that accrue to *all* transit users (including existing transit riders), including both direct time savings and other attributes of premium transit services such as service reliability, safety and security, branding, span of service, etc.; (2) better reflects the *cause* of ridership increases – improvements in travel time and other attributes of major transit capital investments such as reliability, security, and permanence; (3) reflects the

nature of the service being provided by the candidate project (for example, the measure distinguishes the benefits of long vs. short trips); and (4) does not penalize those agencies which are already providing a high level of transit service in a corridor for which a major capital investment is proposed.

Table 7: Daily and Annual User Benefit Hours

Total Daily User Benefit Hours Vs NB	Total Daily User Benefit Hours Vs TSM	Annual User Benefit Hours Vs. TSM
14,420	10,890	3,267,000

Includes special events

COST EFFECTIVENESS

Cost effectiveness is a measure, required by the Federal Transit Administration (FTA), of the long-term benefits of the proposed project compared to the capital and operating costs of the project. "In its evaluation of the cost effectiveness of a proposed project, FTA considers the incremental cost per hour of transportation system user benefits in the forecast year.

Transportation system user benefits reflect the improvements in regional mobility – as measured by the changes in travel time to users of the regional transit system – caused by the implementation of the proposed project. The cost effectiveness measure is calculated by (a) estimating the incremental "base-year" annualized capital and operating costs of the project (over a lower cost "baseline" of transit service), and then (b) dividing these costs by the projected user benefits. The result of this calculation is a measure of project cost per hour of projected user (i.e. travel-time) benefits expected to be achieved if the project is added to the regional transit system. Proposed projects with a lower cost per hour of projected travel-time benefits are evaluated as more cost effective than those with a higher cost per hour of projected travel-time benefits.³

"Table 8 below presents the thresholds FTA will use in FY 2009 for assigning a *High, Medium-High, Medium, Medium-Low* or *Low* cost effectiveness rating for each proposed project. FTA publishes updates to these breakpoints annually to reflect the impact of inflation." A Medium or better rating is generally required for a project to be permitted to enter preliminary engineering and to receive federal funding.

Table 8 Cost Effectiveness Breakpoints

High	\$11.99 and under
Medium-High	\$12.00 - \$15.49
Medium	\$15.50 - \$23.99
Medium-low	\$24.00 - \$29.99
Low	\$30.00 and over

³ Edited excerpts from *FY 2009 New Starts and Small Starts Evaluation and Rating Process* July 20, 2007 Prepared by: Federal Transit Administration, Office of Planning and Environment, US Department of Transportation

APPENDIX A: CAPITAL COST DETAIL

Red Line Corridor Transit Study

AA / EA

Heavy Rail Option

Capital Cost Estimate

(2007 Dollars in Millions)

Description		Heavy Rail Option
Length (Mile):		11.7
Number of Stations:		10
Number of Revenue Vehicles:		30
10	GUIDEWAY & TRACK ELEMENTS	\$721.83
20	STATIONS, STOPS, TERMINALS, INTERMODAL	\$556.30
30	SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	\$35.00
40	SITEWORK & SPECIAL CONDITIONS	\$132.34
50	SYSTEMS	\$140.49
Construction Subtotal (Sum Categories 10 - 50)		\$1,585.95
60	ROW, LAND, EXISTING IMPROVEMENTS	\$41.37
70	VEHICLES	\$134.74
80	PROFESSIONAL SERVICES	\$507.51
90	UNALLOCATED CONTINGENCY	\$113.48
Total Project Cost		\$2,383.05

Red Line Corridor Transit Study

AA / EA

Heavy Rail Option

Capital Cost Estimate

(2007 Dollars in Millions)

CAT	Description	Alternative Total
	Length (Mile):	11.7
	Number of Stations:	10
	Number of Revenue Vehicles:	30
10	GUIDEWAY & TRACK ELEMENTS	
10.01	Guideway: At-grade exclusive right-of-way	\$31.07
10.02	Guideway: At-grade semi-exclusive (allows cross-traffic)	\$0.00
10.03	Guideway: At-grade in mixed traffic	\$0.00
10.04	Guideway: Aerial structure	\$98.09
10.05	Guideway: Built-up fill	\$0.00
10.06	Guideway: Underground cut & cover	\$138.80
10.07	Guideway: Underground tunnel	\$419.45
10.08	Guideway: Retained cut or fill	\$0.00
10.09	Track: Direct fixation	\$20.45
10.10	Track: Embedded	\$0.00
10.11	Track: Ballasted	\$9.91
10.12	Track: Special (switches, turnouts)	\$4.06
10.13	Track: Vibration and noise dampening	\$0.00
	Subtotal Category 10	\$721.83
20	STATIONS, STOPS, TERMINALS, INTERMODAL	
20.01	At-grade station, stop, shelter, mall, terminal, platform	\$70.66
20.02	Aerial station, stop, shelter, mall, terminal, platform	\$55.52
20.03	Underground station, stop, shelter, mall, terminal, platform	\$234.09
20.04	Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	\$48.00
20.05	Joint development	\$0.00
20.06	Automobile parking multi-story structure	\$70.72
20.07	Elevators, escalators	\$77.31
	Subtotal Category 20	\$556.30
30	SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	
30.01	Administration Building: Office, sales, storage, revenue counting	\$0.00
30.02	Light Maintenance Facility	\$0.00
30.03	Heavy Maintenance Facility	\$0.00
30.04	Storage or Maintenance of Way Building	\$35.00
30.05	Yard and Yard Track	\$0.00
	Subtotal Category 30	\$35.00

Red Line Corridor Transit Study

AA / EA

Heavy Rail Option

Capital Cost Estimate

(2007 Dollars in Millions)

CAT	Description		Alternative Total
40	SITEWORK & SPECIAL CONDITIONS		
40.01	Demolition, Clearing, Earthwork		\$16.57
40.02	Site Utilities, Utility Relocation		\$19.01
40.03	Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		\$7.80
40.04	Environmental mitigation, e.g. wetlands, historic/archeologic, parks		\$8.09
40.05	Site structures including retaining walls, sound walls		\$12.56
40.06	Pedestrian / bike access and accommodation, landscaping		\$43.49
40.07	Automobile, bus, van accessways including roads, parking lots		\$11.69
40.08	Temporary Facilities and other indirect costs during construction		\$13.13
	Subtotal Category 40		\$132.34
50	SYSTEMS		
50.01	Train control and signals		\$69.48
50.02	Traffic signals and crossing protection		\$0.00
50.03	Traction power supply: substations		\$32.01
50.04	Traction power distribution: catenary and third rail		\$0.00
50.05	Communications		\$16.99
50.06	Fare collection system and equipment		\$22.01
50.07	Central Control		\$0.00
	Subtotal Category 50		\$140.49
	Subtotal Construction Costs		\$1,585.95
60	ROW, LAND, EXISTING IMPROVEMENTS		
60.01	Purchase or lease of real estate		\$41.37
	Subtotal Right-of-Way		\$41.37
70	VEHICLES		
70.01	Heavy Rail Vehicles		\$134.74
	Subtotal Vehicles		\$134.74
80	PROFESSIONAL SERVICES		
80.01	Preliminary Engineering	4.0%	\$63.44
80.02	Final Design	6.0%	\$95.16
80.03	Project Management for Design and Construction	5.0%	\$79.30
80.04	Construction Administration & Management	8.0%	\$126.88
80.05	Insurance	2.0%	\$31.72
80.06	Legal; Permits; Review Fees by other agencies, cities, etc.	3.0%	\$47.58
80.07	Surveys, Testing, Investigation, Inspection	3.0%	\$47.58
80.08	Start up	1.0%	\$15.86
	Subtotal Professional Services	LS	\$507.51
90	UNALLOCATED CONTINGENCY	5.0%	\$113.48
	Project Total		\$2,383.05

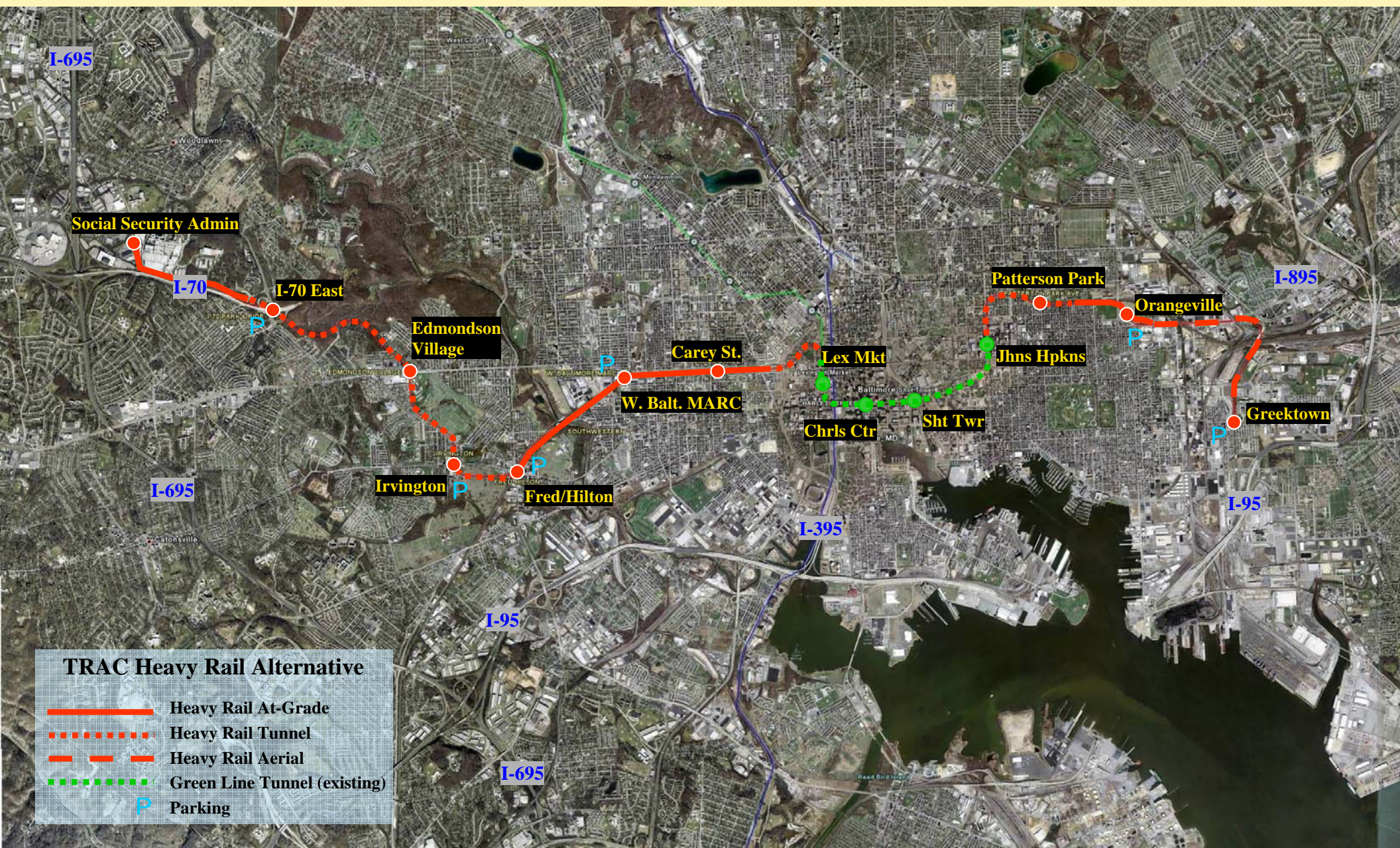
Heavy Rail Alternative

Purpose: Determine the cost, ridership, and cost effectiveness of an additional heavy rail alternative provided by Ed Cohen

Assumptions:

- **Same design standards as existing Metro**
- **Same vehicle as existing Metro**
- **Use 34 vehicles from existing fleet**
- **Major repairs at existing shop**
- **New storage yard**
- **Connect with existing tunnel at Lexington Market and Johns Hopkins**

Alignment



Stations

Stations	Park & Ride	Connecting Transit Service
SSA	No	M6, 15, 40, 44, 77; Extend 10 to SSM and SSA
I-70 East	Yes	15A, 40 (B2 from Howard Co)
Edmondson Village	No	20, 23, 26, 40, and 150
Irvington	Yes	10
Fred Hilton	Yes	10, 16, 20, 35, 320, 329
West Baltimore MARC	Exist	MARC, 15, 23, 40, 51
Carey Street	No	Route 1
Lexington Market (Existing)	No	CLRL, 5, 7, 10, 11, 19, 23, 27, 40, 91
Charles Center (Existing)	No	Metro, 1, 3, 7, 8, 10, 11, 20, 23, 36, 61, and 64
Shot Tower (Existing)	No	Metro, 20, 23, 40
Johns Hopkins (Existing)	No	5, 35, 120
Patterson Park	No	5, 13
Orangeville	Yes	22, 24, 29, 33, 35, 44, 120
Greektown/Bayview	Yes	10, 12, 20, 23, 40, 160, 410, 411, 412, 420

Alignment Issues

- **No parking at Social Security Administration.**
- **Tunnel between I-70 East and Edmondson Village is under Leakin Park, potential 4(f) issue.**
- **Fred-Hilton station may be difficult to site.**
- **W. Baltimore MARC station must move south. Cost not included in this study.**
- **Connection to Metro tunnel at-grade to reduce costs. Requires Metro shut down for a minimum 6 to 9 months. Bus bridge during construction.**

Alignment Issues

- **Availability of ROW along Amtrak near W. Baltimore MARC station and Orangeville not field verified. Some property takes may be required in these areas.**
- **There are limited TOD opportunities with the proposed stations. FTA considers transit supportive land use policies a major factor.**
- **There may be unknown environmental issues along the alignment; no environmental work was performed in this study.**

Capital Cost Estimates

- **Same methodology as Red Line alternatives**
- **Two track guideway of similar design criteria as existing Metro**
- **Stations with 450' platforms to accommodate six-car consists, similar to existing Metro**
- **A flat junction (same level) connecting the Red Line HRT with the existing Metro tunnel**
- **Addition of a pocket track on the north side of Johns Hopkins station**

Capital Cost Estimates

- **Assumes 34 cars from existing fleet will be used on Red Line HRT.**
- **Total Red Line HRT needs fleet of 66 cars, so an additional 32 cars are included in cost estimate.**
- **Assumes a storage yard for 66 vehicles and space for inspection and maintenance. All heavy vehicle repair is assumed to take place at the existing Metro shops on Wabash Ave.**

Capital Cost Estimates

Description		Heavy Rail Option
Length (Mile):		12 new
Number of Stations:		10 new
Number of Revenue Vehicles:		32 additional
10	GUIDEWAY & TRACK ELEMENTS	\$721.83
20	STATIONS, STOPS, TERMINALS, INTERMODAL	\$556.30
30	SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	\$35.00
40	SITWORK & SPECIAL CONDITIONS	\$132.34
50	SYSTEMS	\$140.49
		\$1,585.95
60	ROW, LAND, EXISTING IMPROVEMENTS	\$41.37
70	VEHICLES	\$134.74
80	PROFESSIONAL SERVICES	\$507.51
90	UNALLOCATED CONTINGENCY	\$113.48
		\$2,383.05

Operations

	Metro	Red Line HRT
Distance	15.5 miles	14.3 miles
Travel Time	30 min	26 min
Average Speed	31 mph	31 mph
Headways	8 min peak 10 min midday	8 min peak 10 min midday
Cycle Time	72 min	68 min
Trains	9	9
Consist	6-car trains	6-car trains
Cars	54	54

Feeder Bus Changes

Route	Station Served	Modification
B2	I-70 East	New express route from Marriottsville Rd PnR via I-70
6	Orangeville	New route from White Marsh to Orangeville station
10	SSA	Extended from US 40 north via Rolling Road to Security Square Mall and SSA
12	Bayview	New route from Iverness (Dundalk) to Bayview station
15	Johns Hopkins	Split existing route to have half serve Johns Hopkins on way to CBD
15A	I-70 East	New route to Rutherford Business Park via Windsor Mill Rd
HT15	Orangeville	New route from Bel Air Mall via US 1 to Orangeville station
20	Irvington	Rerouted down to Frederick Rd then back to Baltimore St.
23	Edmondson Ave	Extended through Ellicott City to Normandy Shop Center on US 40
24	Orangeville	Reroute to via Pulaski Hwy to Orangeville station
26	Edmondson Ave	New local route from Marriottsville Rd via US 40
29	Orangeville	New route from Fox Ridge via Pulaski Hwy to Orangeville station
33	Orangeville	Extended via Pulaski Hwy to Orangeville station
35	Fred/Hilton	Short reroute up Hilton Pkwy to Fred/Hilton; also extend to UMBC Tech Center
44	Orangeville	Reroute to serve station
160	Bayview	Reroute via Eastern Ave. to Bayview station
320	Fred/Hilton	New route from Laurel to Fred/Hilton station
329	Fred/Hilton	New route from Columbia to Fred/Hilton station
410	Bayview	Reroute via Eastern Ave. to Bayview station
411	Bayview	Reroute via Eastern Ave. to Bayview station
412	Bayview	Reroute via Eastern Ave. to Bayview station
420	Bayview	Reroute via Eastern Ave. to Bayview station

Travel Demand Estimates

- **Same travel demand model as Red Line alts**
- **Coded the guideway and feeder bus changes**
- **Parking unconstrained**

Travel Demand Estimates

Total Daily Guideway Boardings	Annual Guideway Boardings	Daily New Transit Trips Vs NB	Annual New Transit Trips
43,100	12,930,000	14,690	4,407,000

Annual Special Events Riders
690,000

Total Daily User Benefit Hours Vs NB	Total Daily User Benefit Hours Vs TSM	Annual User Benefit Hours Vs. TSM
14,420	10,890	3,267,000

Cost Effectiveness

Cost effectiveness is a measure, required by the Federal Transit Administration (FTA), of the long-term benefits of the proposed project compared to the capital and operating costs of the project.

$$\frac{\text{(Equivalent Annual Capital \$ + Annual O\&M \$)}}{\text{Annual User Benefit Hours}}$$

Cost Effectiveness

High	\$11.99 and under
Medium-High	\$12.00 - \$15.49
Medium	\$15.50 - \$23.99
Medium-low	\$24.00 - \$29.99
Low	\$30.00 and over

A Medium or better rating is generally required for a project to be permitted to enter preliminary engineering and to receive federal funding.

Cost Effectiveness

Cap Costs	Equivalent Annual Costs	Above TSM	Net Change in Ops Costs	Above TSM
2,383,000,000	171,515,100	147,465,100	43,000,000	37,794,000

Daily User Benefit Hrs	Above TSM	Annual Benefit Hrs	C/E
14,420	10,890	3,267,000	\$56.71

Appendix H

b'more mobile, The Case for Eastern Avenue on The Red Line, May 2012 and MTA Response Letter



MARYLAND TRANSIT ADMINISTRATION

MARYLAND DEPARTMENT OF TRANSPORTATION

Martin O'Malley, Governor • Anthony G. Brown, Lt. Governor
Darrell B. Mobley, Acting Secretary • Ralign T. Wells, Administrator

October 1, 2012

Mr. Art Cohen, Convener
b'more mobile
artc12health@yahoo.com

Dear Mr. ~~Cohen~~ *Art*:

The Maryland Transit Administration (MTA) has received and carefully reviewed your report entitled "The Case for Eastern Avenue on the Red Line," and I am pleased to respond on behalf of the Secretary of Transportation, the Transit Administrator and the project team. We very much appreciate your interest in making the Red Line project the best that it can be for the citizens of the Baltimore Region in general and the residents of Southeast Baltimore specifically.

Together with the Federal Transit Administration (FTA), we are currently preparing the Final Environmental Impact Statement (FEIS) for the Red Line Project. The FEIS will explain the rationale for selecting an alignment on Boston Street rather than an alignment on Eastern Avenue. It also will include technical reports that summarize the alternatives considered throughout the process, alignments along Eastern Avenue. We anticipate that the FEIS will be published by the end of this year; there will be an opportunity for the public to review and provide comments on the FEIS.

While the FEIS and the associated technical reports are still in preparation, I am writing now to provide a preliminary response to the central issue raised in your letter, namely, the choice between Boston Street and Eastern Avenue alignments for the eastern section of the project, from approximately Downtown to Bayview.

Background

The consideration of alternatives for the Red Line Project began during the scoping phase of this study when FTA and MTA developed and evaluated a wide range of potential alignments and modes for providing improved transit service in the Red Line corridor. The scoping process was used to identify a set of alternatives that were carried forward for detailed study in the Alternatives Analysis/Draft Environmental Impact Statement (AA/DEIS). The detailed-study alternatives include a No Build Alternative, a Transportation System Management (TSM) alternative, six Bus Rapid Transit (BRT) Alternatives, and four Light Rail Transit (LRT) Alternatives. The BRT and LRT alternatives included alignments in the Eastern Avenue/Fleet Street Corridor as well an alignment in the Boston Street corridor.

Mr. Art Cohen
Page Two

The AA/DEIS analyzed the BRT and LRT alternatives based on a broad range of evaluation criteria. This analysis was included in the AA/DEIS, Chapter 6, *Evaluation of Alternatives*. The evaluation applied the same set of criteria to all of the build alternatives. Factors considered in the AA/DEIS included their effectiveness in meeting the project's Purpose and Need, as well as their impacts, cost, cost-effectiveness, and equity. The AA/DEIS described the trade-offs among the alternatives, but did not identify a preferred alternative. During the public comment period on the AA/DEIS, FTA and MTA received comments from stakeholders throughout the corridor, expressing many different viewpoints about the alternatives.

After the AA/DEIS was published and the comment period had ended MTA selected a Locally Preferred Alternative (LPA) for the Red Line Project. The LPA included an alignment on Boston Street, which was primarily on the surface, rather than a surface or tunnel alignment on Eastern Avenue. Since then, MTA has worked with FTA to advance the LPA. The LPA, with some refinements, will become the Preferred Alternative in the FEIS. We anticipate that the Preferred Alternative in the FEIS will include an alignment on Boston Street, transitioning from a tunnel to the surface east of the intersection with Montford Avenue/Hudson Street, and then continuing in the median of Boston Street through the Canton community.

Response to "The Case for Eastern Avenue"

Your report recommends renewed consideration of surface or tunnel alignments on Eastern Avenue. The appendices to the FEIS will include a detailed response to your report. In this letter, I will summarize the main reasons why we have concluded that the project should continue to include the proposed alignment along Boston Street.

1. Ability to Meet Purpose and Need

Your report included an extensive analysis of demographic data in the Southeast area of Baltimore City and draws the conclusion that an alignment on Eastern Avenue would serve more local users than an alignment on Boston Street. (p. 1) The report defines local users as "the persons living around the Patterson Park and Highlandtown areas." (p. 34)

It is reasonable to expect that an alignment along Eastern Avenue would attract a greater number of residents from the Patterson Park and Highlandtown Areas, because many of those residents would be within a short walking distance of Eastern Avenue. But, the potential benefits to a specific neighborhood are just one part of a larger picture. In comparing the benefits of the alternatives, we are required to consider their ability to achieve the Purpose and Need for the Red Line project as a whole. An important element of the Purpose and Need is to enhance connections between existing and future developments in the corridor, specifically including the Canton community. Providing improved transit service to the Canton area was identified as a goal in the 2002 regional rail plan, and is consistent with the City's plans for transit-oriented, mixed-use development in that area.

As documented in the AA/DEIS, alignments on Boston Street and Eastern Avenue would have similar overall ridership: the AA/DEIS projected 42,100 daily trips on Alternative 4C, which followed Boston Street, and 42,300 daily trips on Alternative 4D, which included tunnel under Eastern Avenue. But, viewed from the perspective of this Purpose and Need, a Boston Street alignment is preferable to an alignment along Eastern Avenue, because it more directly connects to existing and planned major activity centers in the corridor.

In addition, an alignment along Boston Street will provide benefits even to residents who are not within a short walking distance of that alignment. Many residents of the Patterson Park and Highlandtown neighborhoods will be within walking distance of at least one Red Line station, such as the Fell's Point station. In addition, Eastern Avenue is currently served by numerous bus routes that connect to the proposed Red Line stations.

On balance, while Boston Street and Eastern Avenue alignments would provide different combinations of benefits, we have concluded that the Boston Street alignment overall is more consistent with the purpose and need of the Red Line project because it provides direct connection to the Canton area.

2. Environmental Justice and Equity

Your report includes an extensive demographic analysis of the neighborhoods surrounding the Boston Street and Eastern Avenue alignments. The analysis shows that the neighborhoods surrounding the Eastern Avenue alignment have a higher concentration of low-income and minority residents. Your report concludes that an alignment along Eastern Avenue would be more consistent with Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, because it would more directly serve these low-income and minority communities.

It is clear from the information in your report, and from the information in the AA/DEIS itself, that the areas along Eastern Avenue have a higher concentration of minority and low-income residents than the areas along Boston Street. See AA/DEIS, Figure 4-1, Environmental Justice Areas. The FEIS will include an updated environmental justice analysis, based on 2010 Census data. The use of 2010 Census data shows that the areas along Eastern Avenue continue to have a higher proportion of low-income and minority residents than the areas along Boston Street.

Under the Executive Order, the FTA is required to determine whether a proposed project would have "disproportionately high and adverse effects" on minority and low-income communities. (AA/DEIS, p. 58). In July of this year, FTA issued an updated circular describing its policies for implementing the Executive Order. FTA Circular 4703.1, *Environmental Justice Policy Guidance for FTA Grant Recipients*. This circular provides more detailed regarding compliance with environmental justice principles, but the basic requirements remain the same. The circular describes the guiding principles as follows:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations;
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process;
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

The FEIS will include a comprehensive analysis of environmental justice issues, in accordance with FTA Circular 4703.1. The analysis will take into account all three of the factors noted above. While that analysis is still in preparation, some basic observations can be made. First, it is clear that any alignment along Eastern Avenue would have greater impacts on minority and low-income residents, both during construction and during operation of the facility. Those impacts would not necessarily preclude selection of an Eastern Avenue alignment, but they clearly would be a drawback of an Eastern Avenue alignment. Second, a Boston Street alignment would not reduce transit service to minority and low-income communities; it would enhance existing service by providing an additional option which complements the existing transit service in those neighborhoods.

Overall, I am confident that the currently proposed alignment along Boston Street will be fully consistent with environmental justice requirements. The Red Line would improve accessibility for all communities including low-income, minority, and transit-dependent populations. While some impacts would occur within these communities, these impacts would be minimal compared to the project's benefits to minority and low-income populations, including accessibility and a faster, more reliable mode of transit.

3. *Engineering, Cost, and Impact issues*

Your report proposes two specific alternatives that use Eastern Avenue: (1) a surface alignment that runs on Eastern Avenue along the edge of Patterson Park, and then continues onto the residential Bank Street and Gough Street, and (2) a tunnel alignment that runs underneath Eastern Avenue. In general, the report concludes that these alternatives would be technically feasible, would attract strong ridership, and could be constructed with lower impacts and/or lower cost than was assumed in the analysis of Eastern Avenue alignments in the AA/DEIS.

For the FEIS, MTA conducted a technical analysis of the alternatives proposed in your report. This analysis will be documented in a technical report that will be published as part of the FEIS. In summary, the conclusion of our technical analysis is as follows:

Mr. Art Cohen

Page Five

- The proposed surface alignment along Eastern Avenue would have impacts on Patterson Park, which would require approval by FTA under Section 4(f) of the U.S. Department of Transportation Act. Given the amount of parkland that would need to be taken and the nature of the impact on that parkland, it is unlikely that those impacts would be considered "de minimis" for purposes of Section 4(f).
- The proposed surface alignments along Bank and Gough Streets would dramatically change the character of those residential streets.
- Any tunnel alignment under Eastern Avenue would be substantially more costly than the proposed surface alignment along Boston Street. The additional cost of a tunnel alignment along Eastern Avenue would jeopardize the financial feasibility of the project as a whole.

In closing, we respect and appreciate your interest in the Red Line and your desire to make the Red Line accessible to as many residents as possible, including minority and low-income citizens. The MTA has strived to do the same, and that is why we believe we have a project that is beneficial to the citizens in the Baltimore region and is projected to have ridership of 55,000 trips per day in 2035. We believe the Preferred Alternative has struck the best balance between serving the residents in the corridor with quality transit service and accounting for impacts and capital costs. I would be happy to discuss our position on our report with you at any time. I may be reached at hkay@mta.maryland.gov or 443-451-3721.

Sincerely,



Henry M. Kay
Executive Director for Transit Development and Delivery

cc: Mr. Ralign Wells, Administrator, MTA



May 7, 2012

Henry Kay, Executive Director
MTA Transit Development & Delivery
100 South Charles Street
Tower Two, Suite 700
Baltimore, MD 21201



HENRY
Dear Mr. Kay:

RE: The Case for Eastern Avenue on the Red Line

The enclosed advocacy document argues that, based primarily on recent US Census Data and legal standards of environmental justice and equity, the residents of Southeast Baltimore would be much better served if the Red Line were built either on or underneath Eastern Avenue. This would replace the current proposal to run it along Boston Street in south Canton and Brewers Hill. A section of the document (at pages 14-15) points out why it is not too late to change these stations and this part of the Red Line route. The heart of the document is the data section (pages 18-35). There is also a section about determining the financial costs for a route and stations along Eastern Avenue. The document contains 36 graphics, eight photos, and ten tables interlaced with the text in order to make things clearer. For an overview, there is also a two-page Executive Summary.

It is hoped that this material will be approached with an open mind, and that the suggestions made here will be carefully considered.

It is recognized that this document represents only a beginning for the proposed change. It will be essential to build support within the Southeast Baltimore communities which would most benefit from an Eastern Avenue route and stations. It will also be necessary to persuade you and other transportation agency officials - as well as elected officials at the local, State and federal levels - about the need for this change. It is understood that this will take time, and that it will take determination and persistence.

Thank you for the attention you give to the case this document makes for Eastern Avenue. An electronic copy of this advocacy document will be made available on the web at www.bmoremobile.org later this month - after the printed copies have been distributed.

Sincerely:

Art Cohen

Art Cohen, Convenor
b'more mobile
Baltimore, Maryland
Phone: 410-664-1192
E-Mail: artc12health@yahoo.com

NOTE: For the distribution list with the names of all addressees, see the inside cover of the document.

The Case for Eastern Avenue on The Red Line



b'more mobile
O O O O O O

May 2012



The content of this work is licensed under a
Creative Commons Attribution-NonCommercial-ShareAlike License.

Distribution List:

AGENCIES

FEDERAL

Federal Transit Administration, USDOT
U.S. Environmental Protection Agency
National Park Service
U.S. Department of Housing and Urban
Development

STATE

✓ Maryland Department of Transportation
Maryland Transit Administration
Maryland Department of the
Environment
Maryland Department of Planning
Baltimore Red Line
Citizens' Advisory Council

REGIONAL

Baltimore Metropolitan Council

CITY

Baltimore City Department of
Transportation
Baltimore City Department of Planning

ELECTED OFFICIALS

FEDERAL

Senator Barbara A. Mikulski
Senator Benjamin L. Cardin
Congressman John P. Sarbanes, Dist. 3
Congressman Elijah E. Cummings, Dist. 7

STATE

Governor Martin O'Malley
From Legislative District 46:
Senator William C. Ferguson, IV
Delegate Luke Clippinger
Delegate Peter A. Hammen
Delegate Brian K. McHale

BALTIMORE CITY

Mayor Stephanie Rawlings-Blake
City Council President Bernard C. "Jack"
Young
Councilperson James B. Kraft, Dist. 1

ORGANIZATIONS

Brewers Hill Community Association
Canton Community Association
Canton-Highlandtown Community Association
CASA de Maryland
Creative Alliance
East Baltimore Community Association
Education-Based Latino Outreach
EnvisionBaltimore
Friends of Patterson Park
Greater Baltimore Committee
Greektown Community Association
Greektown Community Development Corp.
Hampstead Hill Improvement Association
Highlandtown Community Association
Highlandtown Merchants Association
Historic East Baltimore Community Action
Coalition
Latino Service Providers Network
Milton Avenue Community Association &
Development Corp.
NAACP
Neighbors of Brewers Hill
Patterson Park Neighborhood Association
Patterson Place, Inc.-A Community Taking Action
Red Line Now PAC
Southeast Community Development Corp.
Southeast Presidents' Council
Southeastern Improvement Association
Transportation For America (T4America)
Transportation Equity Network (TEN)

* * *

After this distribution has been completed, "The
Case for Eastern Avenue" will also be posted
online for download as a PDF on the website for
b'more mobile at:

www.bmoremobile.org

***This advocacy document is dedicated to the
transit riders - actual and potential - of
Southeast Baltimore.***

THE CASE FOR EASTERN AVENUE ON THE RED LINE

Table of Contents

	Page
<i>Executive Summary</i>	i
=====	
Introduction: <i>Public Transportation is Important</i>.....	1
1) <i>Stations are us</i>.....	2
a) Stations or Routes?	
b) Evolution of the Stations Now Planned for Southeast Baltimore	
c) Better Locations for the Stations In Southeast Baltimore	
d) It Is Not Too Late to Reconsider the Red Line Stations or Routes	
2) <i>Ridership</i>.....	15
a) The MTA's Limited Basis for Estimating Ridership	
b) What do the Data Tell Us?	
3) <i>Legal Basis for Changing the Stations</i>.....	32
a) Assessing Environmental Justice: Analysis and Comparison of Data Obtained from all Four Scenarios	
b) Putting Some Specificity into Equity in Southeast Baltimore	
i) Transit Service Equity	
ii) Health Equity	
4) <i>Eastern Avenue - A Fairer Route with More Productive Stations</i>.....	45
a) Street-Level (Surface) Route - along Eastern Avenue	
b) Proximity to Patterson Park - The Draft Section 4(f) Evaluation	
c) The Tunnel Route - under Eastern Avenue	
d) Costing Out Eastern Avenue	
e) What It Will Take to Replace the Canton Route with the Eastern Avenue Route - A Call to Action!	
i) The Role of Government	
ii) The Role of The Communities Around Patterson Park and in Southeast Baltimore	
Bibliography of Sources.....	60

* * *

- Please turn over this page to see the List of Figures and Photos -

THE CASE FOR EASTERN AVENUE

<u>List of Figures and Photos</u>	<u>Page</u>
Figure A - Inset of "Initial Staff Draft" dated January 7, 2001.....	3
Figure B - Red Line in Southeast Baltimore (Geog. Areas 8 & 9 combined).....	5
Figure C - Red Line Locally-Preferred Alternative in Southeast Baltimore.....	6
Figure D - Red Line Locally-Preferred Alternative end-to-end.....	6
Figure E - 1948 Rail Map of Canton Area.....	8
Figure F - 2011 Map of Baltimore Railroad Network.....	8
Figure G - Eastern Avenue Surface Route, showing the stations.....	9
Figure H - Eastern Avenue Tunnel Route, showing the stations.....	10
Figure I - Map with suggested SE Baltimore station changes.....	10
Figure J - Potential Service Areas showing yellow + blue color coding.....	11
Figure K-1 - 1/4-Mile Walking Radius - Eastern Route.....	12
Figure K-2 - 1/4-Mile Walking Radius - Canton Route.....	12
Figure L-1 - 1/2-Mile Walking Radius - Eastern Route.....	13
Figure L-2 - 1/2-Mile Walking Radius - Canton Route.....	13
Figure M - Eastern Side of the Study Area - final contours (2008).....	19
Figure N - Potential service areas to be compared with study area line.....	19
Figure O - Canton area map (cell #10) used for Travel Demand Forecast.....	20
Figure P - Official census tract numbers for these areas.....	21
Figure Q-1 - Color-coded areas showing "full count" census tract coverage.....	24
Figure Q-2 - Color-coded areas showing "closer areas" census tract coverage..	26
Figure Q-3 - Color-coded areas showing "shared areas" census tract coverage.	28
Figure Q-4 - Color-coded areas showing "closer" and "shared" areas CT coverage	30
Figure R - Areas showing environmental justice denial near Eastern Ave. Route	38
Figure S - BCHD Boundaries used for Patterson Park North & East.....	43
Figure T - BCHD Boundaries used For Canton.....	43
Figure U - BCHD Boundaries used for Highlandtown.....	43
Figure V-1 - Map of Eastern Avenue Route - on the surface.....	45
Photo 1 - Looking East on Eastern Avenue next to Patterson Park.....	46
Photo 2 - Looking West on Eastern Avenue next to Patterson Park.....	46
Photo 3 - Looking East on Bank Street next to Patterson Park.....	47
Photo 4 - Looking East on Bank Street near Conkling Street.....	47
Photo 5 - Looking East on Bank Street at its east end.....	47
Photo 6 - Looking West on Gough Street from its east end.....	47
Photo 7 - Looking West on Gough Street near Conkling Street.....	47
Photo 8 - Looking West on Gough Street near its west end at Patterson Park..	47
Figure V-2 - Eastern Ave. Surface Route, showing the stations [repeat of Fig. G]	47
Figure W-1 - Cross-section of double-tracked light rail.....	48
Figure W-2 - Cross-section of single-tracked light rail.....	48
Figure X - Plan View of direction changes on Bank/Gough Couplet.....	49
Figure Y-1 - Map of Eastern Avenue Route - using a tunnel.....	51
Figure Y-2 - Eastern Ave. Tunnel Route, showing the stations [repeat of Fig. H]	52
Figure Y-3 - Cross-section of Eastern Avenue Tunnel.....	52
Figure Z - Map with suggested SE Baltimore station changes [repeat of Fig. I]	53

NOTE: *All eight photographs were taken in 2011.*

The Case for Eastern Avenue - EXECUTIVE SUMMARY

In Southeast Baltimore, the Red Line's stations should be placed along, and the alignment should go on or under, Eastern Avenue, not on Boston Street as currently planned. Why? For three basic reasons, each of which has a basis in federal transportation and environmental law:

- 1) The Eastern Avenue route would serve many more local users.
- 2) The people who live near Eastern Avenue meet the environmental justice threshold.
- 3) The people who live near Eastern Avenue need and would benefit more from the increased public transportation service and health benefits that the Red Line will provide.

Ridership

New US Census Data show that, by almost every measure, the people living around Patterson Park and in Highlandtown along or to the north of Eastern Avenue are much more transit-dependent than those living along Boston Street in the Canton and Brewers Hill area. They own fewer automobiles per household. Transit stations located there would also serve many more people than would be served by stations located along Boston Street. If the current Boston Street (Canton) route were to be replaced by the Eastern Avenue route, the total number of persons potentially served would increase from 8,700 to a range from 14,000 to 28,000.

Environmental Justice

According to the US Census, both significantly more and a higher percentage of Black, Hispanic, or low-income persons are living around Patterson Park and in Highlandtown, than are living in the Canton and Brewers Hill Area. The federal environmental justice threshold is met by the people living in the Patterson Park/Highlandtown area. Environmental justice requires that public transportation service not be denied to minority and lower-income persons relative to their neighbors or the general population.

Service Equity and Health Equity

Routing the Red Line along Boston Street would adversely affect service equity for the persons living around Patterson Park and in Highlandtown. The two stations in Canton and at Canton Crossing would be much more difficult for them to reach on foot than would be the two stations located along Eastern Avenue, at both ends of Patterson Park.

The latest Baltimore City Health Department data show that residents of the area to the east and north of Patterson Park have health indicators far below those of persons living in the Canton and Highlandtown areas, in fact, some of the lowest levels in the entire city.

Public transit improvements can improve health outcomes and reduce healthcare costs. Regular daily walking to and from public transit stops can contribute to personal health, and counteract the sedentary lifestyle so common for Americans today. Furthermore, many physically and economically disadvantaged people depend on public transportation to access

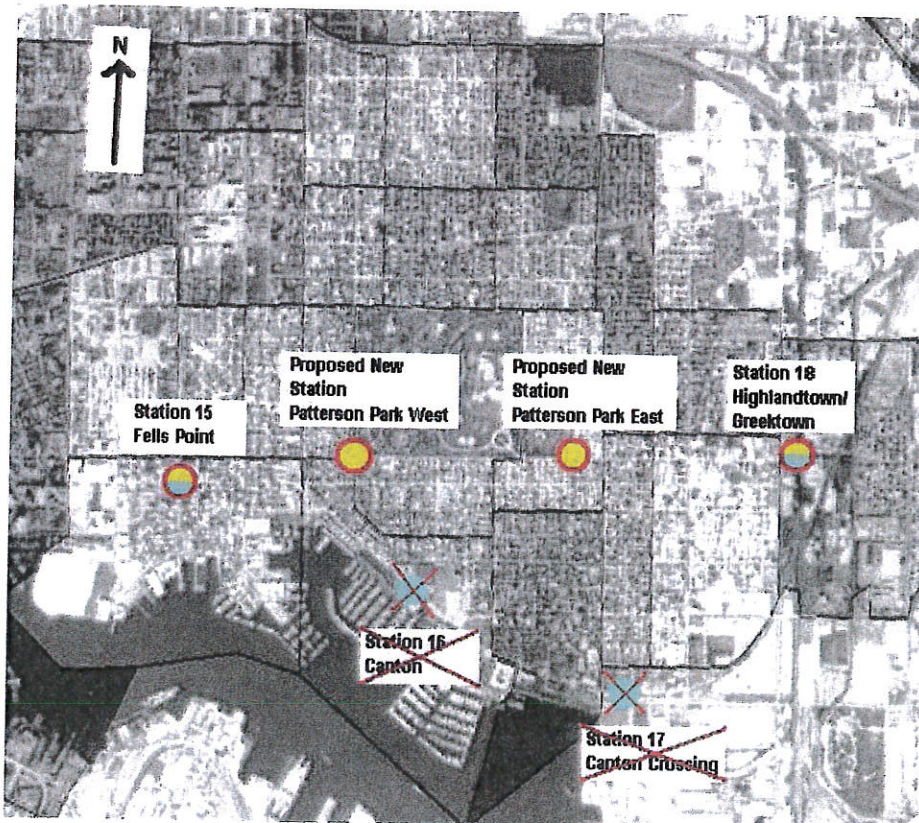
medical services and to obtain healthy, affordable food. Locating the stations along Eastern Avenue instead of Boston Street would produce positive health outcomes for many more of Southeast Baltimore's residents.

Eastern Avenue - A Fairer Route with More Productive Stations

There are two alternatives along Eastern Avenue: street-level (surface) or by tunnel. The surface route would proceed eastbound and westbound along the southern edge of Patterson Park until Ellwood Avenue, at which location it would turn north along the eastern edge of the Park. It would then proceed eastward along Bank Street to the Highlandtown/Greektown Station, then west from that station along Gough Street to rejoin Ellwood.

The tunnel route would proceed entirely under Eastern Avenue south of Patterson Park and under Eastern through Highlandtown to the Highlandtown/Greektown Station. Although a tunnel route would have many advantages over a surface route, it would be much more costly. However, the total cost, even for a tunnel, would be under the \$2 billion maximum established by MTA for financial feasibility.

If this Case for Eastern Avenue is found to be persuasive, government action and strong community advocacy will still be required to replace the currently planned Canton Route and stations with the more suitable Eastern Avenue Route and stations. Communities living around Patterson Park and in Southeast Baltimore will have to come together in a coalition to demand and push for such a change. Such community efforts have been effective at producing significant changes in transit plans in other metropolitan areas, and there is every reason to believe that they can succeed here in Southeast Baltimore with the Red Line and "do it right." The graphic below shows what such a change in stations would look like.



Introduction: Public Transportation Is Important

People are the lifeblood of the city, and transportation is its circulation system. A city offers a concentration of human activities based on employment, education, culture, commerce, recreation, communications, and social connectivity. Missing and clogged "transportation blood vessels" can adversely affect these activities and, in so doing, impair the functioning of the city, as well as the health of its people. Good public transportation ensures optimal access to all these activities.

Because of the need to walk to and from public transportation, a greater degree of physical activity is usually required than that needed for driving an automobile. As a consequence, regular riders of public transportation have more favorable health indicators than comparable drivers of automobiles. Ambient air quality is much less impaired by public transportation use than by personal automobile use. "Healthy Baltimore 2015" [published by the Baltimore City Health Department in May 2011¹] also cites improved public transportation as a creative strategy to increase access to healthy and fresh food. According to the World Health Organization, public transport promotes health by providing exercise, reducing fatal accidents, increasing social contact, and reducing air pollution ["Social Determinants of Health - The Social Facts" 2nd Edition, World Health Organization - 2003²].

Over the past fifty years, Baltimore City and the larger Baltimore metropolitan area have had relatively poor public transportation. In the words of Ben Cardin, US Senator for Maryland, "Baltimore has been underserved by public transit." This has severely reduced people's options for getting around the metropolitan area and has reduced both the social and economic vitality and vibrancy of our city and its surrounding communities.

The few transportation improvements within the region include the Metro rail line from Owings Mills in Baltimore County to Johns Hopkins Hospital in East Baltimore, the Light Rail line from Hunt Valley in Baltimore County through the City to Cromwell and BWI Marshall Airport in Anne Arundel County, some express buses, and an improved MARC commuter line. However, the overall system is disjointed and unconnected - the different modes of transportation have not been sufficiently integrated. And what buses do come, come too infrequently and often off schedule.

Now, we are told, the Red Line is coming. It will represent the first major improvement in east-west transportation through the heart of the City, from the eastern edge of Baltimore City (Johns Hopkins Bayview Medical Center) to western Baltimore County (Woodlawn and Social Security). The Red Line is the beginning of what is hoped for in the way of greatly expanded rail transportation for residents of this region. As characterized recently by a leading architectural firm in the area, RTKL, the Red Line will be an "enhancement to the City." [Urbanite Magazine - No. 88 - October 2011 - Page 41³]

The primary purpose of public transportation is to serve members of the public, by transporting them. This may seem like a statement of the obvious. But, the proposed route for the Red Line along Boston Street through southern Canton would poorly serve many Southeast Baltimore residents - those persons who live there and who need, depend upon, and would use such improved public transportation. These are the long-suffering transit riders who for years have been waiting so long for our local buses to show up. Their time to enjoy the benefits of efficient new public transportation is long overdue. For the most part, they do not live along Boston Street, but on the many blocks to the north of it, nearer to all sides of Patterson Park and Eastern Avenue. In fact, over the years, many concerned persons, including government and elected officials, have stated that the transportation planners should have chosen Eastern Avenue over Boston Street for the Red Line.

This is an unjust and inequitable situation. Now, during this design, planning, and engineering phase, is the time both to ensure environmental justice and to restore equity in planned new public transportation for Baltimore. Both the law and sound public policy require this for actual and potential transit riders. The following sections will discuss Stations, Ridership, the Legal Basis for Changing the Stations, and the details of proposed change to a route and stations along Eastern Avenue.

1) Stations Are Us

a) Stations or Routes?

The Red Line Corridor Transit Study's Alternatives Analysis/Draft Environmental Impact Statement [hereinafter referred to as the AA/DEIS⁴] was completed and published in September 2008 by the Maryland Transit Administration (MTA). It was accompanied by nineteen technical reports (also including 33 appendices and a group of profiles). The total number of pages exceeded 4,300. The AA/DEIS presented eleven alternatives - consisting of one managed enhancement of the existing transit system (TSM - #2); six Bus Rapid Transit (BRT - #3) routes; and four Light Rail Transit (LRT - #4) routes.

Most of the reports on the Red Line refer to alternatives (i.e., route alignments) rather than stations. However, for the riding public's access to and use of public transportation, station location is of paramount importance. Although it seems that routes are decided upon first and then station locations are arrayed along such routes, transportation planning done with the actual and potential riders in mind would choose station locations first, and then infer (or derive) routes to pass through such stations. This observation is supported to some extent by the AA/DEIS report:

Equity, Economic and Environmental Measures
Number of Transit-Dependent Households Served

As shown in Table 6-4 [page 118], there are 14,148 to 16,649 households along Alternatives 2 through 4D which do not own a vehicle. Unlike other measures, this evaluation measure ... is entirely dependent on the location of the specific alignment, the number of stations, and the location of stations. *The number and location of stations have the most effect on reaching the most households without a car.*

Furthermore, alternatives which use the Eastern Avenue alignment reach more zero-car households than on Boston Street.... [italics added]
[AA/DEIS report, page 120]

...Station locations associated with transit projects are generally seen as the primary benefit to nearby neighborhoods. Access to another mode of travel increases transportation options for accessing work, shopping, school, or entertainment. [AA/DEIS report, page 61]

Therefore, Service Equity involves more than the location of the light rail lines. It also has a great deal to do with the location of stations along those lines, because it is only through stations that people gain access to this form of public transportation.

b) Evolution of the Stations Now Planned for Southeast Baltimore

More than a decade ago, at the beginning of the technical planning process which culminated in the August 2002 final "Baltimore Region Rail System Plan - Advisory Committee Report," an "initial system concept" map for "Downtown Rail Lines and Connections" was developed by the MTA. This map, labeled "Initial Staff Draft," was **dated January 7, 2001**. It proposed a route in Southeast Baltimore identical to the current route along Boston Street (see the inset below - Figure A), with two stations ("Boston Street" and "Canton") also identical, respectively, to the current two stations ("Canton" and "Canton Crossing").

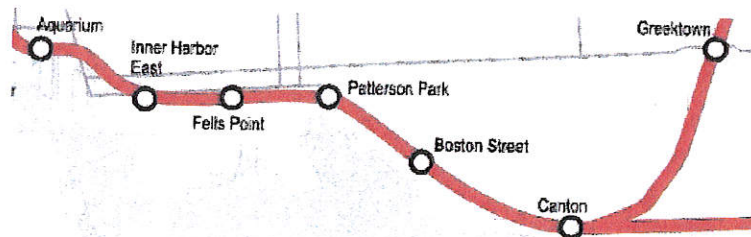


Figure A

This initial systems-concept map was part of the PowerPoint presentation made to the Advisory Committee at its sixth meeting on January 8, 2002. This map was an enlarged portion of the "Menu of Rail Lines" that had been developed for the

technical planning process. Little is said about the basis for these station decisions, and they are described as "conceptual locations" [see page 17 of the 2002 Technical Report on the Baltimore Region Rail System Plan⁵]. At that same January 8, 2002, meeting, during a discussion of "service coverage," a committee member asked: "Will the east-west Red Line adequately serve the needs of the transit dependent population in east ... Baltimore?" The meeting minutes then went on to state: "To accomplish this purpose, the Red Line in east Baltimore should be on Eastern Avenue rather than Boston Street." This may have eventually led to the inclusion of an Eastern Avenue Route along with the Boston Street route - in both the Draft System Plan presented for public review and comment in late January and early February 2002, and the final recommended Baltimore Regional Rail System Plan adopted in March 2002.

In 2003, one year after this broad visioning effort, planning for the Red Line began in earnest. The general routing for the Red Line was to be from the east edge of Baltimore City (at the Johns Hopkins Bayview Medical Center) through Southeast Baltimore City, the downtown area, West Baltimore, and Baltimore County in the west (Woodlawn). However, this left unanswered several important questions about the specific routing through and station location in existing neighborhoods and commercial areas.

During the Red Line planning process, in looking where to place the east-west route across Baltimore City and into western Baltimore County, there was initial consideration of two routes for Southeast Baltimore. This continued up through the publication in September 2008 of the AA/DEIS. These routes were as follows:

The Canton Route - One route alignment with two stations was slated to follow at street level the south Canton waterfront along Boston Street, and then proceed through Brewers Hill to an Eastern Avenue station (#18) at the easternmost end of Highlandtown.

The Eastern Route - This other route alignment, also with two stations, would have proceeded in an easterly direction along Eastern Avenue south of Patterson Park and then through Highlandtown. If designed to be in a tunnel, it would have been located below Eastern Avenue. If, on the other hand, it was designed to be at street level, it would have proceeded along parallel paths (called a couplet) along Eastern Avenue and Fleet Street. In either design variation, it would have ended up at the same Eastern Avenue station, (#18) near Haven Street, as the Canton Route.

Both the original alternative route alignments (Canton and Eastern) are shown here below in this composite graphic for Geographic Areas 8 and 9 (from the AA/DEIS, pages 224 and 231):

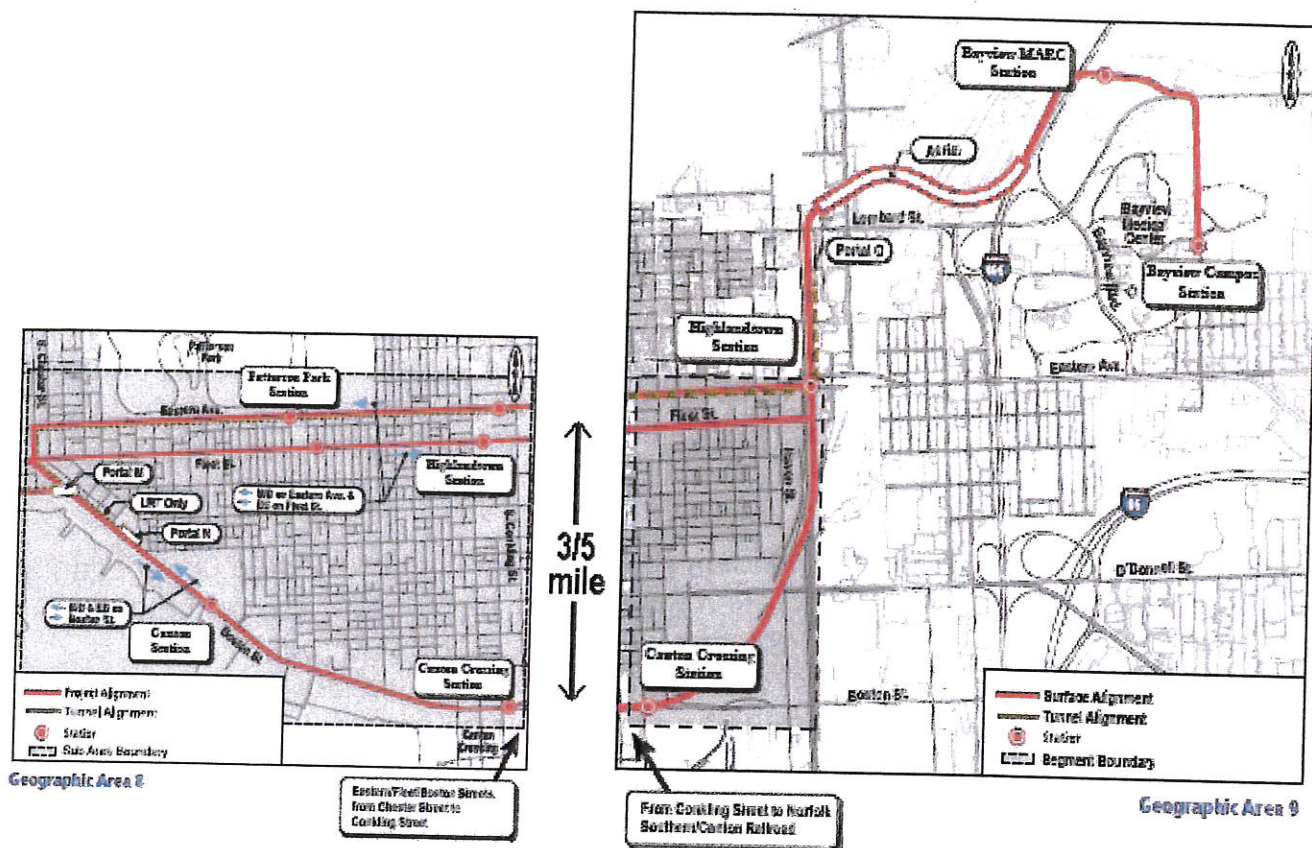


Figure B (combined)

KEY POINT: It must be understood that this 1.5 mile section (pictured above) of the more than fourteen miles of the Red Line is unique because it is the only area from among the four light rail alternatives proposed to have such a substantial north-south geographical separation (roughly 3/5 mile) between the alternative station sets and their respective routes - that is, between using Eastern Avenue for the "northern" or Patterson Park route, and Boston Street for the "southern" or Canton route. Of the four alternative light rail alignments in the AA/DEIS, two (4A and 4D) were proposed to go along Eastern Avenue and two (4B and 4C) were proposed to go along Boston Street. This separation adds a dimension to be evaluated when deciding how to choose between two very different routes and their respective sets of stations. It poses vexing issues to be considered both by members of the local communities and the transportation planners and decision-makers. It also calls for a much closer, finer-grained look at census and other data for these areas of Southeast Baltimore than was done by the AA/DEIS, in order to provide a basis for choosing the best station locations and route.

The Canton Route (Canton/Brewers Hill area) - the lower route in the graphic above - was selected by Governor Martin O'Malley in August 2009 as part of the "locally preferred alternative" (LPA⁶), using light rail (and similar to the AA/DEIS Alternative

4-C). It is depicted below in Figure C.

RED LINE MAP

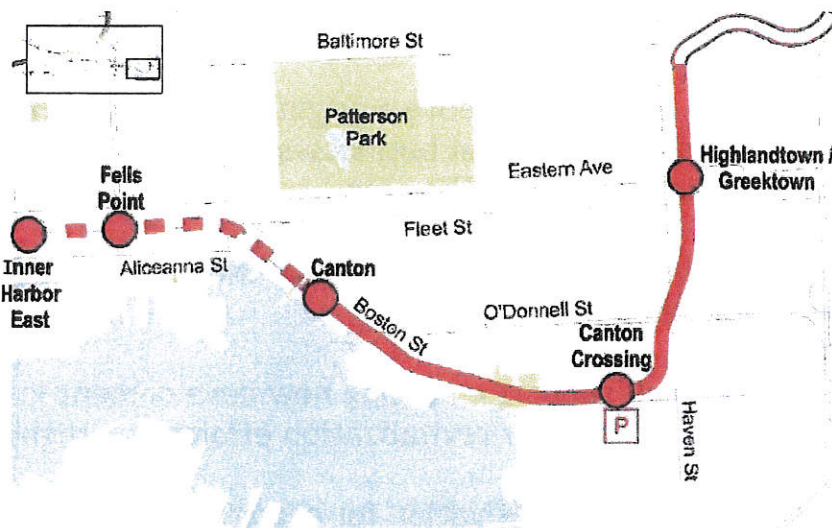


Figure C (from www.baltimoreredline.com)

Below is a map of the Overall Red Line Route - approved as Locally-Preferred Alternative, with an oval added to show the location of the Southeastern section:

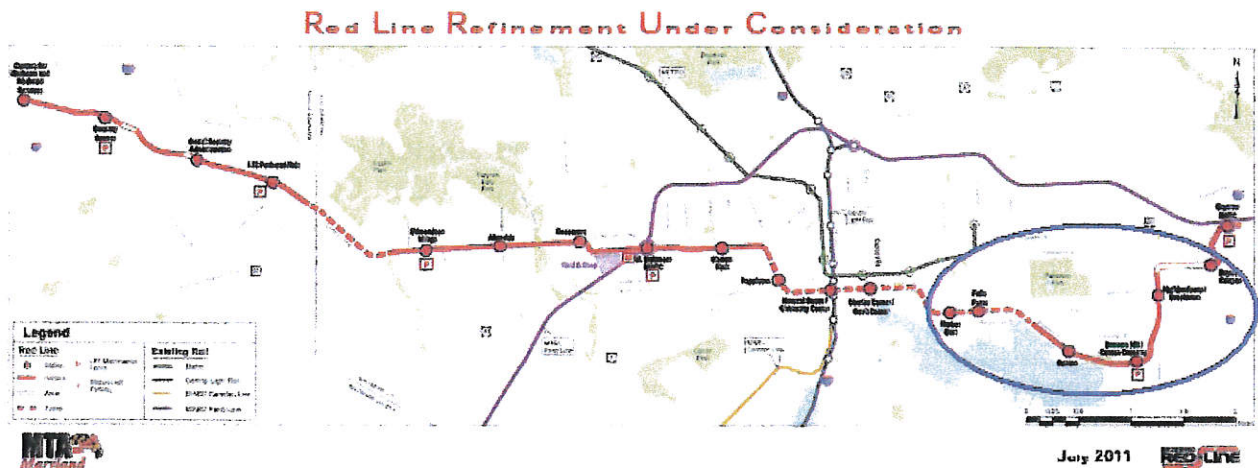


Figure D (from www.baltimoreredline.com)

So why was the Boston Street alignment chosen? The principal reason appears to have been to serve the residents and commercial enterprises located in Canton. Both the Canton and Canton Crossing "Station Objectives" provide that:

[Each station] ... can serve as a origin Station for the nearby residential communities. It can also serve as a destination station for those commuters that work, play, and shop in the area. [AA/DEIS Stations Technical Report, both at page 211 and page 228]

It is worth noting that this language, which refers to commuters, differs from that used to justify both stations (Patterson Park and Eastern Avenue) alternatively proposed along Eastern Avenue and Fleet Street, which reads as follows (at pages 201 and 208 of the Stations Technical Report):

[Each station] ... can serve as both a origin and destination station for the residential community, local businesses, recreational facilities, and the educational institutions in the area.

According to the Red Line web site's statement on the "Locally-Preferred Alternative (LPA)" [www.balTIMOREREDLINE.com]:

The Red Line LPA will support emerging new development in...Canton Crossing.... It could also spur revitalization efforts at...Highlandtown....

This would explain some of the motivation for choosing the Boston Street route. On the other hand, much of Highlandtown is bypassed by this southern, coastal route through Southeast Baltimore.

Perhaps the most detailed statements for choosing the Boston Street alignment may be found in the recent Station Area Advisory Committee (SAAC) "Vision Plans" for the Canton and Canton Crossing Stations (#16⁷ and #17⁸, respectively) which were published on November 1, 2011:

[Canton Station Vision Plan⁹ - page 10]: The station location is close to active retail area at Safeway and the American Can Company, and will provide direct access to this desirable destination as well as the waterfront....

[Canton Crossing Station Vision Plan¹⁰ - page 10]: This station location, associated facilities and alignment satisfy the SAAC Vision Plan goals and guiding principles, and include many positive impacts on the area. The station location is adjacent to future development sites and will provide easy access to destinations north and south of Boston Street, and the alignment minimizes and distributes impacts on future developable land.... Embellishing this facility with active uses, especially along Eaton Street, will also enhance the pedestrian connection between the dense residential uses being developed at Brewers Hill and the station....

In any case, except for the statements quoted above, it is not at all clear how the initial decisions about the Canton stations, which date from at least as early as January 2001 (see above at page 3), were made.

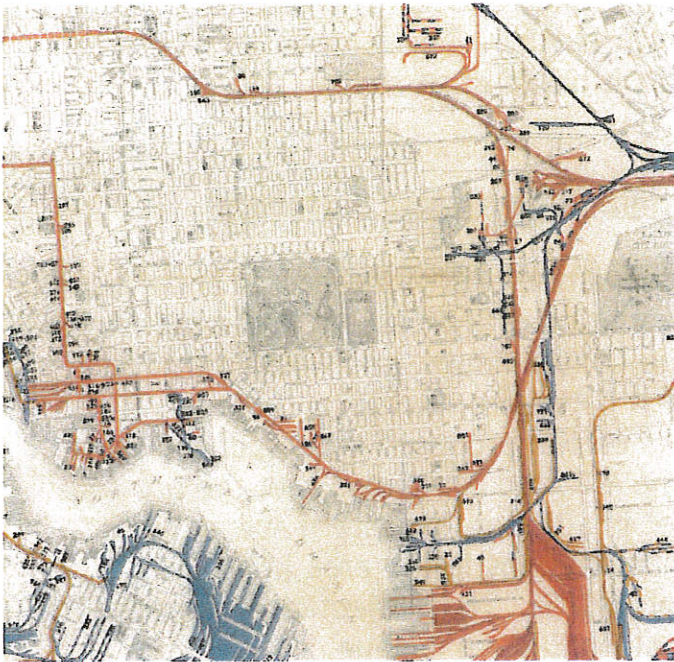


Figure E

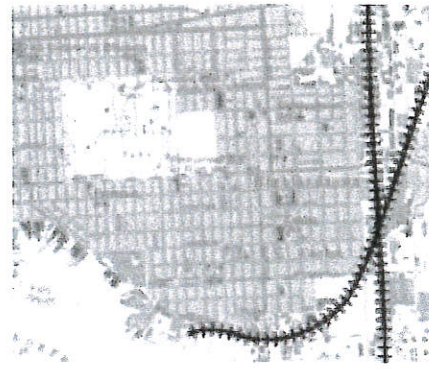


Figure F

It is quite likely also that the Canton route may have been chosen partly because of the preexistence of rail rights of way along the same alignment. Figure E above on the left is a 1948 rail map of the area [Industrial Bureau - Baltimore Association of Commerce¹¹]. Note that this rail alignment was used for carrying freight, not human passengers. Figure F shows these rail lines as depicted in the same area in a later report [US Department of Transportation Report on "Baltimore's Railroad Network" (2011) -inset from Figure 2-13 on page 2-10¹²].

During the past three years, the Boston Street route has had its share of local opponents. Below is a paraphrase of some of their opinions:

Boston Street is already congested, so to add light rail would only compound the glut of vehicles • The rail line will "divide the fabric" of the Canton Community to the north and south of Boston Street • The rail line will cut off visual and actual access to the waterfront on the south side of Boston Street • The tunnel portal at the west end of Boston Street will be a monstrosity which will take up and displace valuable urban space • The automobile is central to life in Canton, and rail-based public transportation is not needed • Boston Street is not the best route for the new light rail through Southeast Baltimore.

So far, none of these objections to Boston Street has been found by the MTA to be persuasive. But, regardless of these objections, it is not so much that the route along Boston Street is without any merit. It is rather that a route along Eastern Avenue to its north is significantly better and much more in line with federal environmental justice and transit and health equity standards. And this superiority

speaks directly to the principal goal of public transportation - to enable as many people as possible to move from one place to another. This superiority of Eastern Avenue over the Boston Street Canton Route is based upon riders - actual and potential - for the new Red Line.

c) **Better Locations for the Stations in Southeast Baltimore**

Despite this initial decision, it is the firm conviction of *b'more mobile* and a number of other organizations and persons that a variation of the Eastern Route (as originally proposed) would be highly preferable to the Canton Route, and would much better serve the needs of transit riders in Southeast Baltimore, including those who live in Canton. This approach eliminates, from the earlier proposed version of the Eastern Route, any involvement of Fleet Street. The MTA had concluded that the previously proposed Eastern Route's use of Fleet Street in addition to Eastern Avenue would have had an adverse effect on traffic flow and parking in the area [AA/DEIS - Neighborhood Effects Technical Report - April 2008]. That objection is removed by the change proposed here to proceed only along Eastern Avenue.

Currently, the Red Line, moving west to east, is slated to loop down along Boston Street and stop at the Canton Station (Station #16) and the Canton Crossing Station (Station #17) before going up to the Highlandtown/Greektown Station (Station #18) on Haven Street and Eastern Avenue.

We are proposing to replace this route by having the Red Line go along Eastern Avenue instead, following either a surface route (which also includes Bank and Gough Streets in Highlandtown) or a tunnel route. It, too, will end up at the Highlandtown/Greektown Station (Station #18) on Haven Street.

This Case for Eastern Avenue is advocating for either this surface route:

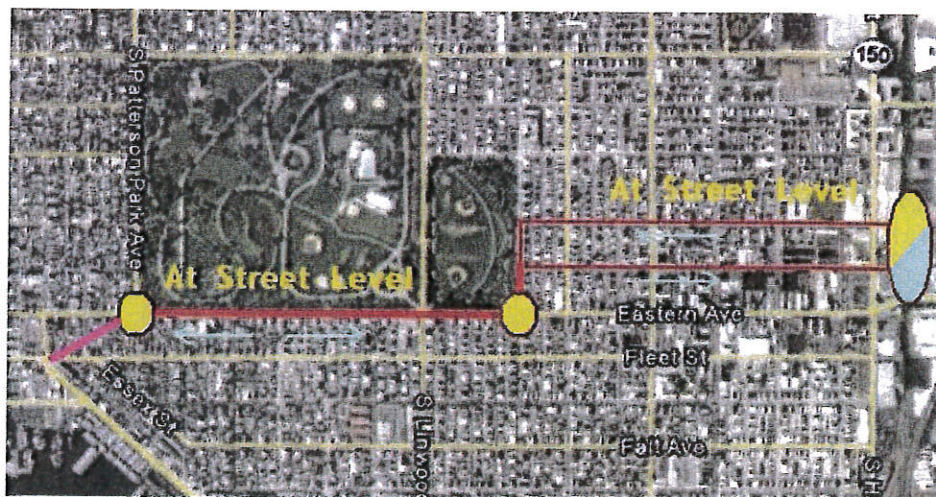


Figure G

or this tunnel route:



Figure H

A comparison of the proposed and current stations looks like this [the color coding for the stations is based on Figure J, following on page 11]:

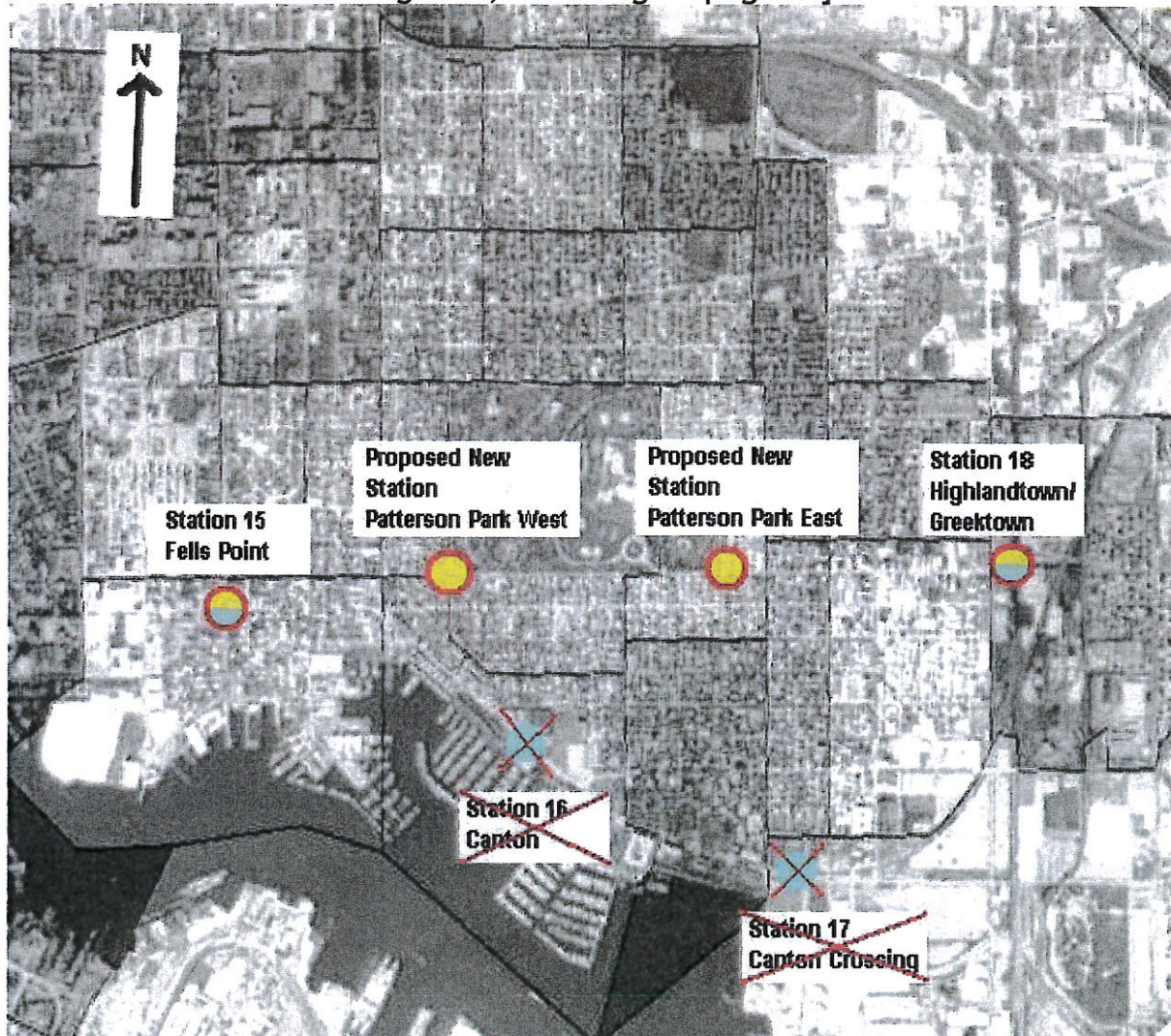


Figure I

The yellow and blue color coding used directly above for the stations in Figure I will be used throughout this advocacy document. Figure J below shows the geographic areas to which these two colors apply in Southeast Baltimore. This color coding is used as follows: in the map graphics at pages 9-13, 19, 24, 26, 28, 30, 38, 45, 47, 51-53, and in the Executive Summary; at the top of the table columns at pages 25, 27, 29, 31, 33-35, 44, and 54.

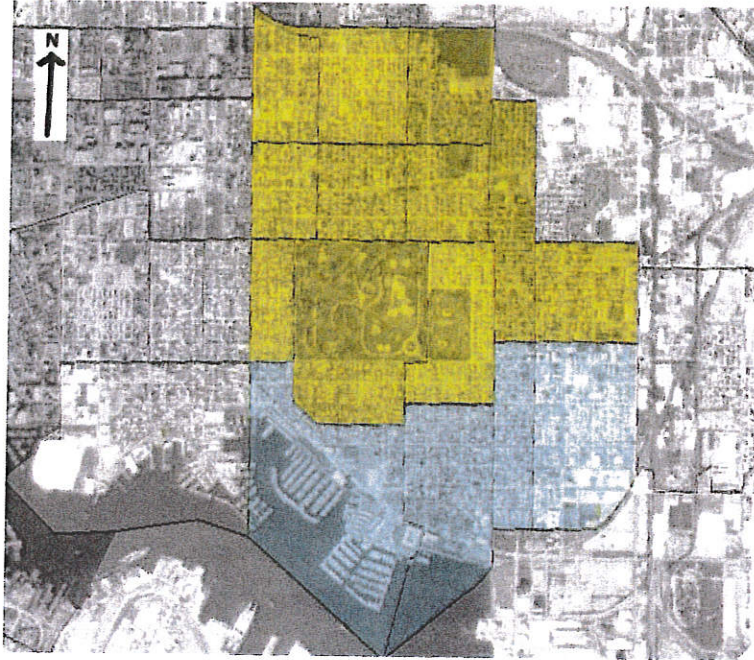


Figure J

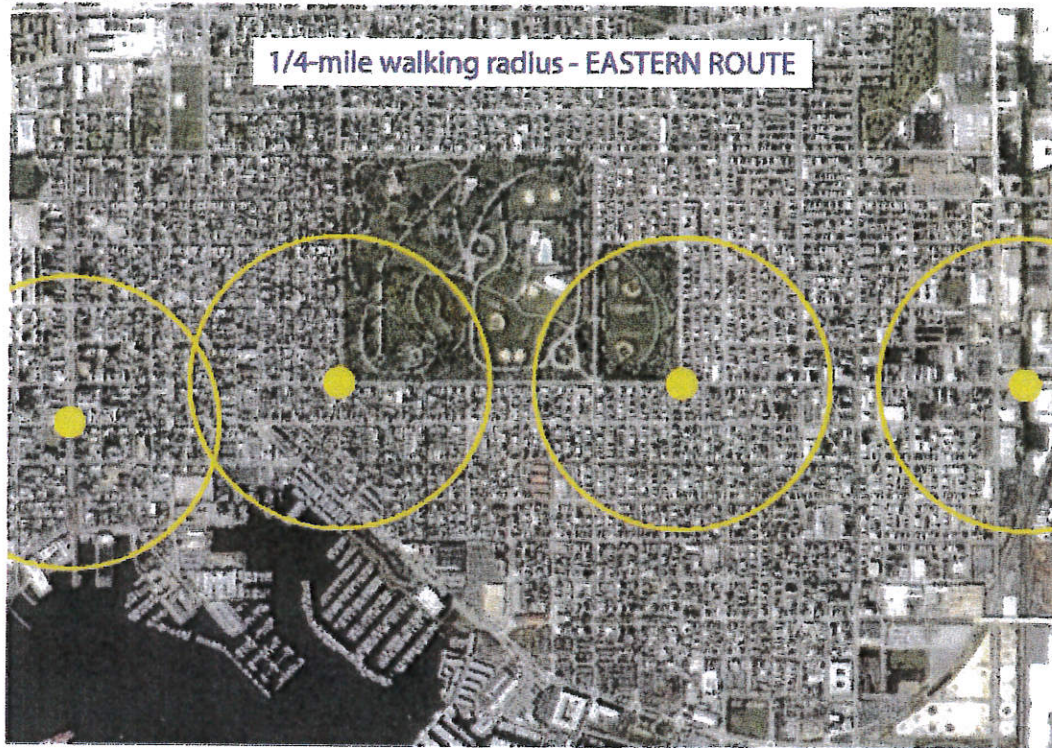
These two routes can be contrasted more powerfully and dramatically showing both a 1/4-mile and a 1/2-mile radius to indicate walkability for residents in the area around proposed stations along Boston Street below Canton, where areas in Highlandtown to the east of Patterson Park, and areas north of Patterson Park, are completely neglected for Red Line service. The MTA makes the following identical statement in its AA/DEIS analysis of each of the 29 stations [AA/DEIS Stations Technical Report - April 2008]:

[Station Name]

A. COMMUNITY DEMOGRAPHICS ...

All figures illustrate a one-quarter mile walk zone...[which] is considered the distance someone would be willing to walk to gain access to transit. The actual walk zone area would differ from that shown as it is a 1/4 mile along a walkable path (along roads, sidewalks, etc.), not a straight 1/4 mile from the station. However, the circle is used for graphical purposes. The Federal Transit Administration (FTA) allows analysis for a transit system based on a 1/2 mile walk zone. As this analysis is completed on a census block level, and any census block even touching the 1/4 mile walk zone is included, much of the 1/2 mile analysis has therefore been incorporated in the Red Line Study.

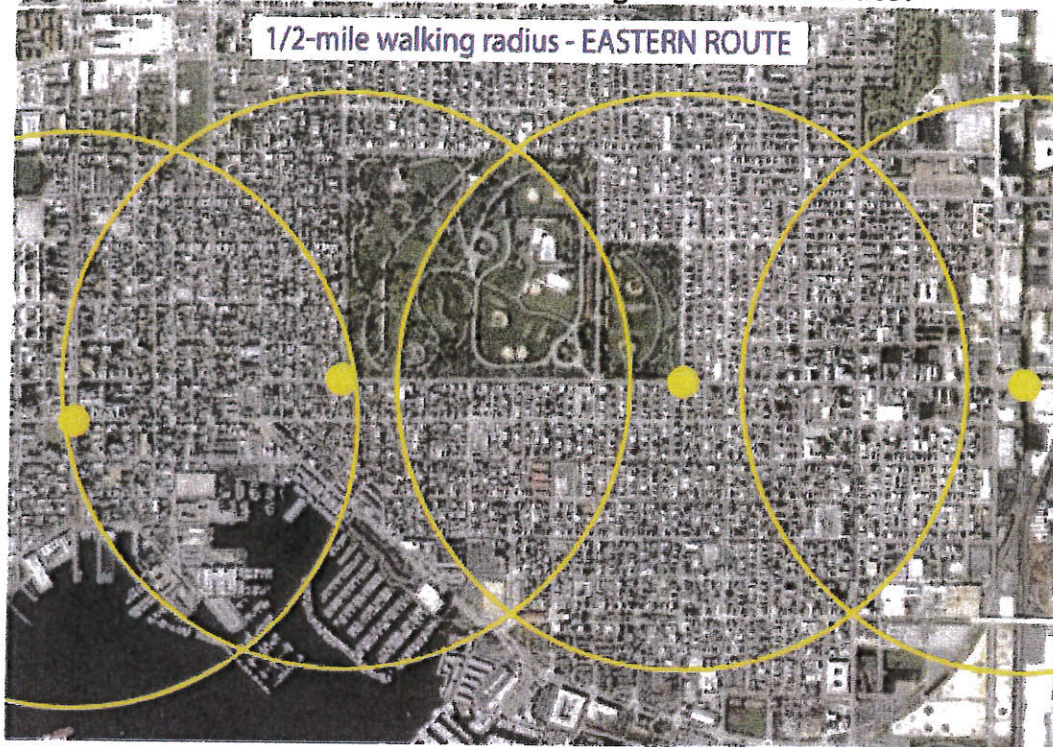
As can be seen using 1/4-mile walking radii, if the Canton Route were retained, large areas of Canton and Highlandtown and at the west and north sides of Patterson Park would lack convenient Red Line service.



Figures K-1 and K-2

This contrast between the Canton and the Eastern routes remains even when one uses the 1/2-mile radius around each proposed stop. West Highlandtown and areas

north of Patterson Park would be unserved using the Canton route.



Figures L-1 and L-2

As stated in Chapter 3 of the AA/DEIS:

Transit patrons would generally walk to a rail station when the distance does not exceed 1/4 to 1/2 of a mile. Beyond that, most patrons would

access a station by either automobile or feeder bus. [page 44]

[An exception would be]...bicyclists [who] would be able to bring their bicycles on board the Red Line. This will expand the service areas of Red Line stations beyond the 1/4 to 1/2 mile walking range of stations without parking facilities. [page 51]

d) It is Not Too Late to Reconsider the Red Line Stations or Routes

The AA/DEIS and its accompanying technical reports were completed and published in 2008. The Locally-Preferred Alternative (LPA) was selected in 2009. However, there is still time to make changes to the Red Line route.

According to official MTA language, the LPA "is Alternative 4C ... with some modifications." As pointed out in the Baltimore Red Line's statement on the Locally-Preferred Alternative, "[m]inor alignment and engineering adjustments to the selected alternative will occur during final design and construction phases of the project" and there is a section titled "Continued Refinement and Modification" which asserts that such refinement and modification "will occur throughout the corridor." That section also contains a bullet which states that:

Alignment along abandoned Norfolk-Southern right-of-way in Canton. Coordination with Norfolk-Southern Railroad, Canton Railroad, Exxon Corp., Baltimore City, developers of the adjacent property, and community leaders will be needed to identify a specific acceptable alignment. [This is in the area to be served by the current Station #18 - Highlandtown/Greektown]

In fact, at the present time, even as work on the Final AA/EIS has begun, reconsideration is underway for the easternmost part of the Red Line as it enters and exits the Bayview area. The Station Area Advisory Committee (SAAC) #19 (for the two stations proposed for Bayview MARC and the Johns Hopkins Bayview Campus), has already developed and is evaluating two new alternative routes, in addition to the original Locally-Preferred Alternative route, within its geographical area of responsibility. Two alternate site locations have been considered for the Canton Station (#16), as discussed both at a special meeting on Oct. 27, 2011 and at the SAAC Meeting #6 on Nov. 17, 2011. Furthermore, consideration is being given by the MTA to a routing change at the western end of the Red Line to eliminate up to two miles of Interstate 70 inside the Baltimore Beltway (Interstate 695).

An important rationale for reconsideration now, in terms of the environmental justice and equity arguments, is that the 2010 US Census data by Census Tract on race and ethnicity were released in 2011. This provides us with much more timely data on those essential demographic characteristics than the 2000 Census. Those

data were already eight years old by the time that the AA/DEIS was published. In addition, in December 2011, the latest data were published from the American Community Survey (ACS) for the period 2006-2010.

These fresh data and other new data are particularly relevant in these areas of East and Southeast Baltimore because of the considerable growth throughout the decade in the size of the Hispanic population. Since the 2008 economic downturn, it is also highly likely that economic differences have increased between residents of the southern Canton area and those around Patterson Park and West Highlandtown. Both of these changes require special attention from the perspective of transit service equity.

The Red Line will be financed under the New Starts federal program. Programs in other cities which are similarly funded have been changed after the AA/DEIS had been submitted and an LPA had been selected (for example, the addition in 2010 by the broad "Stops For Us" coalition of three new stations to the Central Corridor Light Rail Train project in Minneapolis/St. Paul¹³).

A final point: Now in 2012, the future of public transportation funding is, at best uncertain and, at worst, under serious assault in the United States Congress. The recent economic downturn has boosted political efforts to reduce spending. Public transportation is one of the targets of these efforts. In Maryland, transportation funds are becoming depleted, and a State gas or sales tax increase to replenish them is not likely at this time. This has created a situation where taking more time to plan current public transit projects is more workable than it was previously, until such time as the funding picture becomes stabilized and more assured.

2) Ridership

a) The MTA's Limited Basis for Estimating Ridership

In the summer of 2010, there was this exchange of e-mail correspondence¹⁴ between *b'more mobile* and Henry Kay, MTA's Executive Director of Transit Development (quoted only in pertinent part below):

FROM Art Cohen of *b'more mobile* (June 11, 2010):

I have read the MTA analysis of the Eastern/Fleet alternative (and the respective attachments) and have several comments:

1) I see nothing anywhere in this analysis about comparative ridership between the E/F [Eastern Ave./Fleet St.] alternative on the one hand and the 4-C and LPA alternatives on the other. This is a serious omission, and one which makes it impossible at the outset to factor in transportation equity to any serious comparison of alternative

alignments. The federal funding sources at FHWA and FTA are very interested in issues of transportation equity. It is my contention that there are many transit dependent persons living around Patterson Park and Highlandtown, and that a Red Line located along the Park would much better serve such persons than either the 4-C or LPA alignments. The inclusion in the MTA analysis of factor #3 "Transit Service" does not address this. It is confined only to transit travel times, not number of riders....

ANSWER FROM Henry Kay, MTA (June 15, 2010):

1. As I explained when we met several months ago, we committed to investigate only the engineering feasibility and impacts of an Eastern/Fleet alignment. A ridership forecast would be costly and time consuming because it requires the skills of consultants from across the country. Even if we were to run the model I don't believe that ridership on the Eastern/Fleet alignment would be significantly higher than Boston Street since we are only talking about one or two new stations. [Underscoring added.] Unlike Boston Street, the Eastern/Fleet corridor is comprised of small businesses and single family row homes which is a land use that is well served by existing bus service. Moreover, there is virtually no opportunity for additional high density development which is in contrast to Canton, particularly Canton Crossing. While it is true that FTA values service for transit dependent riders, what they really favor is service to underserved communities, which, due to the existing bus service, is not the case in the Eastern/Fleet corridor. In fact, if we added the Red Line and reduced bus service, overall service would be worse for most transit dependent people.

RESPONSE FROM Art Cohen (August 30, 2010), and last correspondence with Mr. Kay:

1) **COMPARATIVE RIDERSHIP:** A ridership forecast for a Red Line alignment along Eastern Avenue was requested in an earlier letter. It does not seem a) worthy of the MTA, b) programmatically sufficient, or c) equitable from a policy viewpoint for future transit customers in East Baltimore for you to answer that request with the statement that a "ridership forecast would be costly and time consuming because it requires the skills of consultants from across the country." It would seem that this is too important an issue to dismiss on the basis of cost or lack of local skills. A major transit line for Baltimore's future is at stake here. Serving existing and potential new ridership is at the heart of any plan for new public transportation. The second argument you put forward is that ridership on the Eastern/Fleet alignment would not be significantly higher than Boston Street "since we are only talking about

one or two new stations." I submit that the reason that ridership would be higher is not primarily due to the number of new stations, but because so many more residents and likely transit users of East Baltimore live near or around an Eastern Avenue alignment than along Boston Street.

What this exchange of correspondence demonstrates is the essential point that MTA, in doing its required "Alternatives Analysis," failed to include for Southeast Baltimore the "degree to which the project increases the mobility of the public transportation dependent population or promotes economic development...." This is contrary to the requirements of the federal New Starts law,¹⁵ under whose authority the Red Line project is being federally funded (see detailed references to that law on page 39 below).

The AA/DEIS used a 27-cell map (PB27) of the Baltimore metro area for the Red Line Corridor District [Travel Demand Forecasting Technical Report - pages 7 and 54 - methodology developed by the consultant firm of Parsons Brinckerhoff¹⁶]. The boundaries of the "Canton" geographical area (labeled as #10) used to determine ridership for Southeast Baltimore is quite large, and at a scale far too large to contrast usefully the ridership at the smaller-cell level of Eastern Avenue and Canton. This is important because ridership projections are used to calculate the Cost Effectiveness Index (CEI), which is a number used by the Federal Transit Administration to evaluate and for the MTA then to choose among transit alternatives eligible for federal funding. In order to obtain finer-grained transit ridership projections, it is necessary to do analysis using other methods which are less complex than the traditional "region-wide" large-scale models like the one used here. For example, as stated in a publication by Fehr and Peers on "Direct Ridership Forecasting":

Rail ridership is traditionally forecasted with region-wide travel demand models, which often represent transportation networks and land use at an aggregate scale. These models are relatively unresponsive to changes in station-level land use and transit service characteristics. As transit trips often represent a relatively small percentage of regional travel, even minor model imprecision can produce erratic swings in location-specific ridership estimates and unreliable transit forecasts. Large, complex models also require substantial and continuing investments of time and money to develop, maintain, and operate.

Direct Ridership Models represent a precise, quick-response alternative for forecasting transit patronage. They are directly and quantitatively responsive to land use and transit service characteristics within the immediate areas of prospective transit stations, and to comparative regional accessibility offered by transit and auto.¹⁷

For the above reasons, the MTA's stated failure and unwillingness to conduct appropriate ridership forecasts on the Eastern Avenue/Fleet Street alignment represent a significant gap in planning appropriately and equitably for public transportation in Southeast Baltimore.

b) What Do the Data Tell Us?

The object here is to explore the nature and extent of Red Line transit service currently being planned for Boston Street in Southeast Baltimore, and to propose a way to replace the stations and route which is currently being promoted with stations and a route which represents a more truly public form of transportation. The primary methodology used here is an analysis of the latest figures on the populations of the Southeast Baltimore area, as contained within the best and most official data collection that we have: the United States Census. The two primary census sources are the 2010 US Census (for its May 2011 publication of data on ethnicity and race) and the American Community Survey (issued in December 2011) for the years 2006-2010 (for data on population numbers and ages, and their economic, housing, and social characteristics). These data go well beyond those marshaled in the MTA's AA/DEIS of the Red Line Corridor Transit Study, which was prepared in September of 2008, in order to lay out the alternative routes and provide some basis for choosing between them, and which relied to a large extent on the 2000 Census and American Community Survey data generated from it up through 2007.

Over 220 years ago, our Founders, through the United States Constitution gave us a data-based method by which to plan basic public projects: the Decennial Census. Carried out by the federal government, using census tracts as the linchpin for developing "small-cell" data, the Census provides a basis for looking at people from a range of different viewpoints, and does so every decade, with intermittent additional reports throughout each decade. We are fortunate that our latest Census information was collected as recently as 2010 and was made available in 2011.

By its own admission, documented above, the Maryland Transit Administration (MTA), in proposing the route through Southeast Baltimore, did not conduct studies of any consequence on the transit ridership of the two different routes. This Case for Eastern Avenue attempts to address that central issue. It aims to provide crucial information which, until now, for reasons too complex and unworthy to explore, has been missing from the many years and substantial funds spent so far on planning this portion of the Red Line.

The final contours of the east side of the MTA Study Area for the Red Line are indicated by the dotted lines on Figure M below [from the AA/DEIS, Figure 1-1, September 2008].

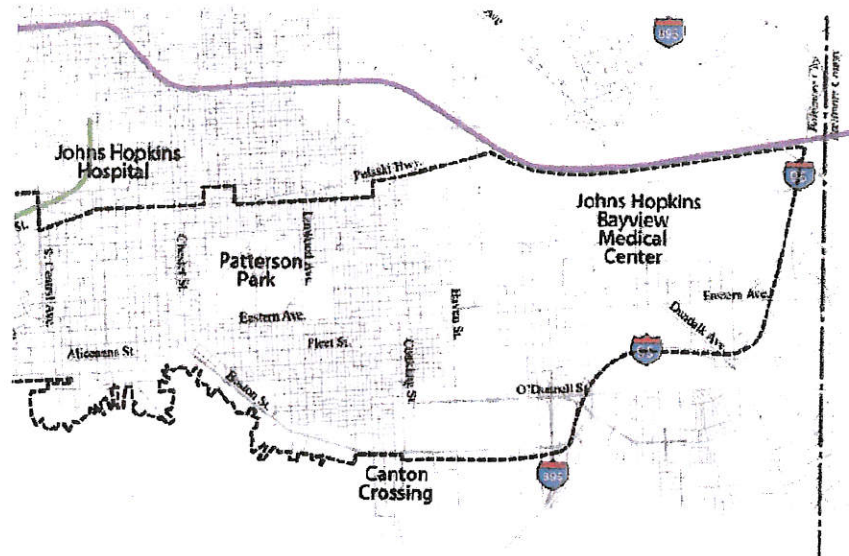


Figure M

In order to fully explore the ridership possibilities for the Red Line in Southeast Baltimore, two geographical areas have been delineated below which would serve, respectively, the people of Canton and Brewer's Hill, and the people of Patterson Park and the western and northern sections of Highlandtown. The northern boundary for the AA/DEIS Study Area has been overlaid toward the top of this graphic.

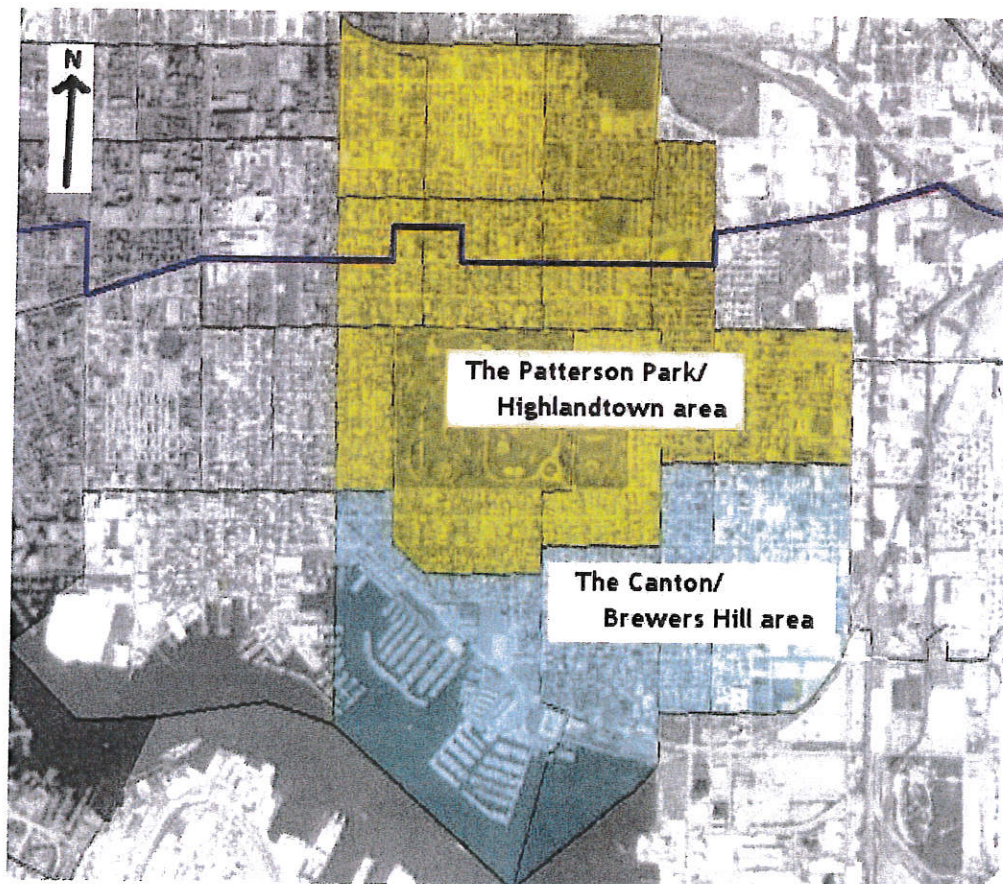


Figure N

The yellow and blue color scheme to refer to both areas is maintained throughout this document and used wherever helpful below in maps and other graphics, and in column titles for data charts below. It was first used above in Fig. J at page 11.

It is significant that the colored-in areas on the above map, viewed together, greatly resemble the so-called Canton area map used in 2007-2008 by the Parsons Brinckerhoff consultants when conducting their PB27 (27-cell) model for their Travel Demand Forecast for the Red Line - labeled as Cell #10 - "Canton". [Cell #10 may be seen in miniature on small, confusingly color-coded region-wide maps at pages 7 and 54 of the AA/DEIS Travel Demand Forecasting Technical Report.] The chief difference is the inclusion of the Fells Point area on the Canton map. That map, obtained from the MTA, looks like this:

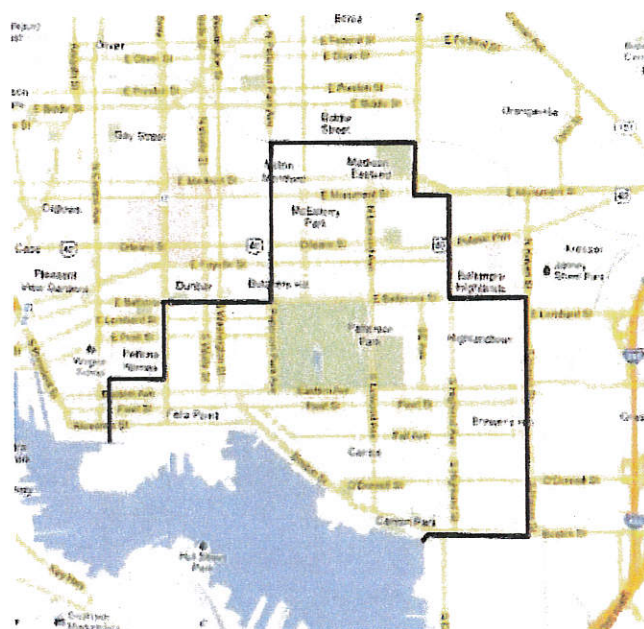


Figure O

The selection of these boundaries to make the travel demand forecast is significant for two reasons:

First, it extends up to Eager Street in East Baltimore, north of the northern boundary of the AA/DEIS Study Area. This provides a rationale for including residents to the north of that same boundary - as has been done for some data purposes below.

Second, it contains an area large enough to encompass both populations living in the Eastern Avenue (Patterson Park/Highlandtown area above) and the Boston Street (Canton/Brewers Hill area above). This implies, as pointed out above at page 15, that the entire area should be studied more closely on a smaller-cell basis than what was used by the AA/DEIS, especially because this is the only proposed area with such great north-south geographical separation (up to 3/5 mile) between the alternative light rail station sets and their respective routes (see page 5 above).

Furthermore, the remaining part of the Highlandtown/Greektown area to the east of Haven Street appears to be within Cell #20 - "Dundalk", which appears on the same two small, confusingly color-coded region-wide maps to extend from Haven Street several miles to the east into the Dundalk and Edgemere areas of Baltimore County, to their borders on the Chesapeake Bay. So, in terms of travel demand, the Cell #20 area includes geographical areas far outside the Patterson Park, Highlandtown, and Brewers Hill areas directly involved in the Red Line.

The Official US Census Tract numbers for the areas (from Figure N above) may be seen below:

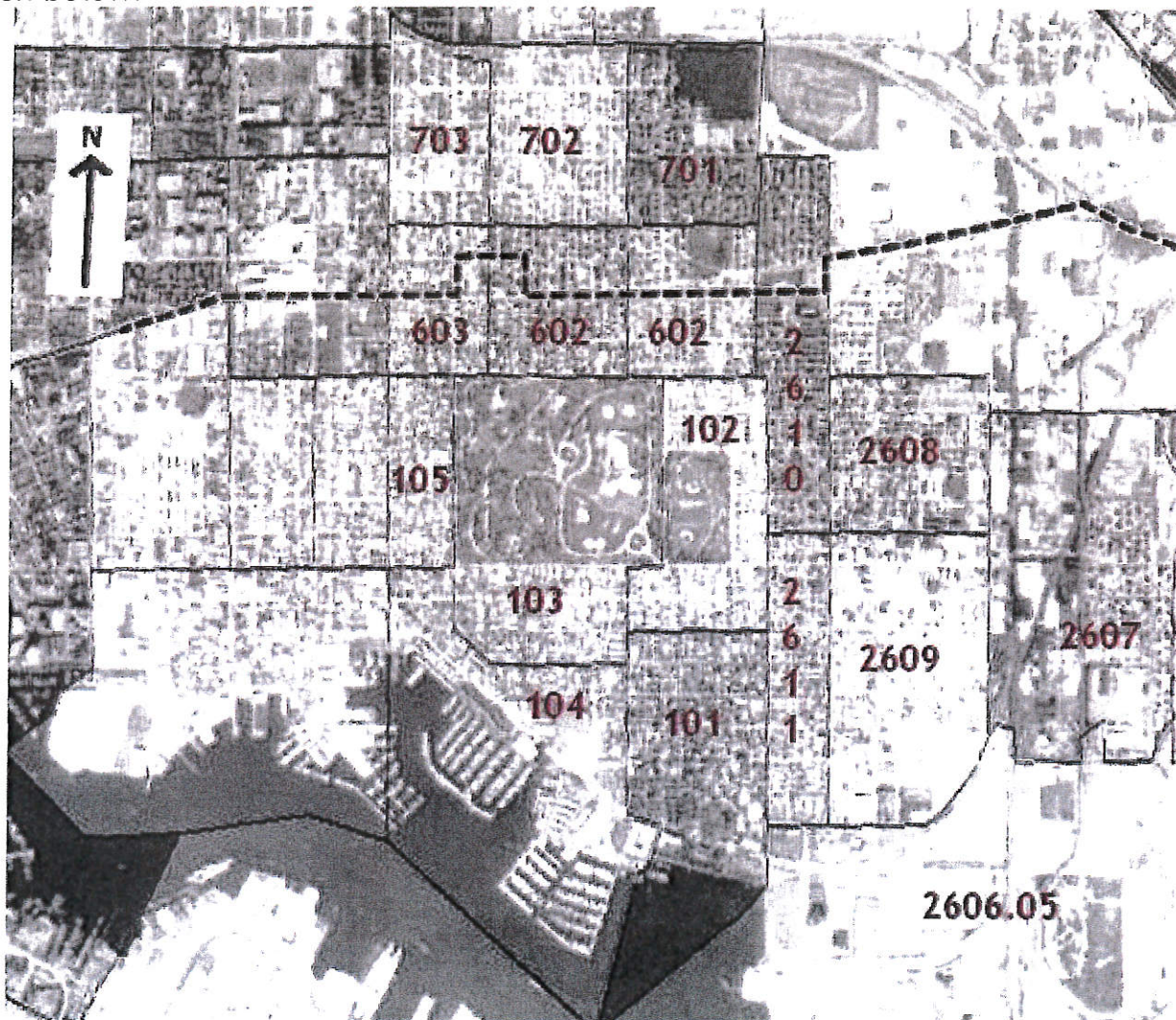


Figure P

Census Tracts 701, 702, and 703 are located entirely outside the northern boundary of the final Study Area. These census tracts are included in Scenarios #1 and #3 below. Parts of Census Tracts 601, 602, and 603 are also located entirely outside the northern boundary of the final Study Area. These Census Tracts are included in all four Scenarios below. Why? Because it is useful at least to explore expansion of the

transit service area into areas located nearby which have a demonstrably high need for and dependency upon transit and very high levels of minority residents. How and why was this decision made to exclude them from the Study Area? These census tracts all include very high levels of minority residents. One is left wondering what the basis was for excluding such residents from the proposed new transit service.

[Please note that, on the far right-hand side of Figure P above:

- a) Census Tract 2607 (Greektown, and the extreme eastern edge of Highlandtown) is shown above but not included in any of the four scenarios below because both of the potential Southeast Baltimore areas to be compared for the Red Line route will use the planned Station #18 near Haven Street for this Greektown and Highlandtown area.
- b) Census Tract 2606.05 in the lower right-hand corner is shown above but not included in any of the four scenarios because, although it is contiguous to the area of the Canton/Brewers Hill line and Station #17 (Canton Crossing), it is primarily industrial, not residential.]

The areas of Southeast Baltimore under evaluation here thus include a total of fifteen census tracts.

*The **Canton/Brewers Hill area (CBH)** [blue] census tracts will be held constant in all four scenarios throughout this analysis. It includes census tracts 101, 104, 2609, and 2611.*

*However, for the **Patterson Park/Highlandtown area (PPH)** [yellow], there is the full count, and three useful variations from the full count which involve using less census tracts.*

Therefore, in order to look at the comparison in the most thorough way, this Case for Eastern Avenue will explore four "scenarios" (an approach familiar to planners). This is to anticipate and cope with objections on the part of some that too many or the wrong neighborhoods are being counted as part of the Patterson Park/Highlandtown area:

Scenario No. 1 (pages 24 and 25): "The Full-Count" - includes eleven [yellow area] Census tracts: 102, 103, 105, 601, 602, 603, 701, 702, 703, 2608, and 2610. [Census tracts 701, 702, and 703 may be located a bit far from Eastern Avenue to be easily accessible for walking to the Red Line. However, for residents from these areas, it may be worth transferring from another mode (like a bus or shuttle) to catch the light rail to go east and west through Baltimore.]

Scenario No. 2 (pages 26 and 27): "The Closer Areas" - includes eight [yellow area] Census tracts: 102, 103, 105, 601, 602, 603, 2608, and 2610. *[The northernmost Census Tracts 701, 702, and 703 have been removed from consideration. They include large and quite low-income sections of East Baltimore, just east of the Johns Hopkins Hospital area.]*

Scenario No. 3 (pages 28 and 29): "Discounting the Shared Areas" - includes eight [yellow area] Census tracts: 102, 601, 602, 603, 701, 702, 703, and 2610. Arguably, the three removed census tracts - 103, 105, and 2608 can be viewed as potential sources for riders for either the Patterson Park/Highlandtown route or the Canton/Brewers Hill route. 103 includes the largest part of Patterson Park itself and three east-west streets to the south of it, while 105 is at the west side of the Park. 2608 is located in the eastern part of Highlandtown, contiguous to the planned Red Line station (#18) near Haven Street. *[As in Scenario No. 1, the northernmost Census tracts 701, 702, and 703 are included.]*

Scenario No. 4 (pages 30 and 31): "Combined Closer and Discounted Shared Areas" - includes only five [yellow area] Census tracts: 102, 601, 602, 603, and 2610. This excludes the other six census tracts which either Scenario No. 2 or No. 3 removes.

[NOTE: In Scenarios Nos. 2, 3, and 4, the black background with yellow print on the list indicates those census tracts which have been removed from consideration in that particular scenario. On the maps themselves, removed census tracts are shown with black print on the gray background.]

Respectively, with both blue and yellow areas taken together, these scenarios below include a total of fifteen census tracts, twelve census tracts, twelve census tracts, and nine census tracts. Below, for each of the scenarios, there will be a chart showing the census tracts included, followed by the data results for that scenario. All numbers and percentages have been rounded.

All the ethnic and racial census data stated below come from the 2010 Decennial US Census.¹⁸ These were the principal characteristics from that census which were first available in 2011. However, compared to the AA/DEIS, they represent a much closer, more comprehensive, and more up-to-date look at the geographic areas in question and the bearing they should have on choice of location for the Red Line route.

Almost all the other census data come from the latest sources existing through 2010: the American Community Survey (ACS) for the years 2006-2010.¹⁹ These data include car ownership, income, unemployment, poverty, age, place of birth, housing status, and educational attainment. Disability data from the 2000 Census are also included. More recent disability data by census tract will not be available for some time, because they are now being developed through the American Community Survey, and not as part of the current 2010 Census releases.

Scenario No. 1 [The Full-Count]:

PATTERSON PARK/HIGHLANDTOWN AREA

Census Tract 102, Baltimore city
Census Tract 103, Baltimore city
Census Tract 105, Baltimore city
Census Tract 601, Baltimore city
Census Tract 602, Baltimore city
Census Tract 603, Baltimore city
Census Tract 701, Baltimore city
Census Tract 702, Baltimore city
Census Tract 703, Baltimore city
Census Tract 2608, Baltimore city
Census Tract 2610, Baltimore city

CANTON/BREWERS HILL AREA

Census Tract 101, Baltimore city
Census Tract 104, Baltimore city
Census Tract 2609, Baltimore city
Census Tract 2611, Baltimore city

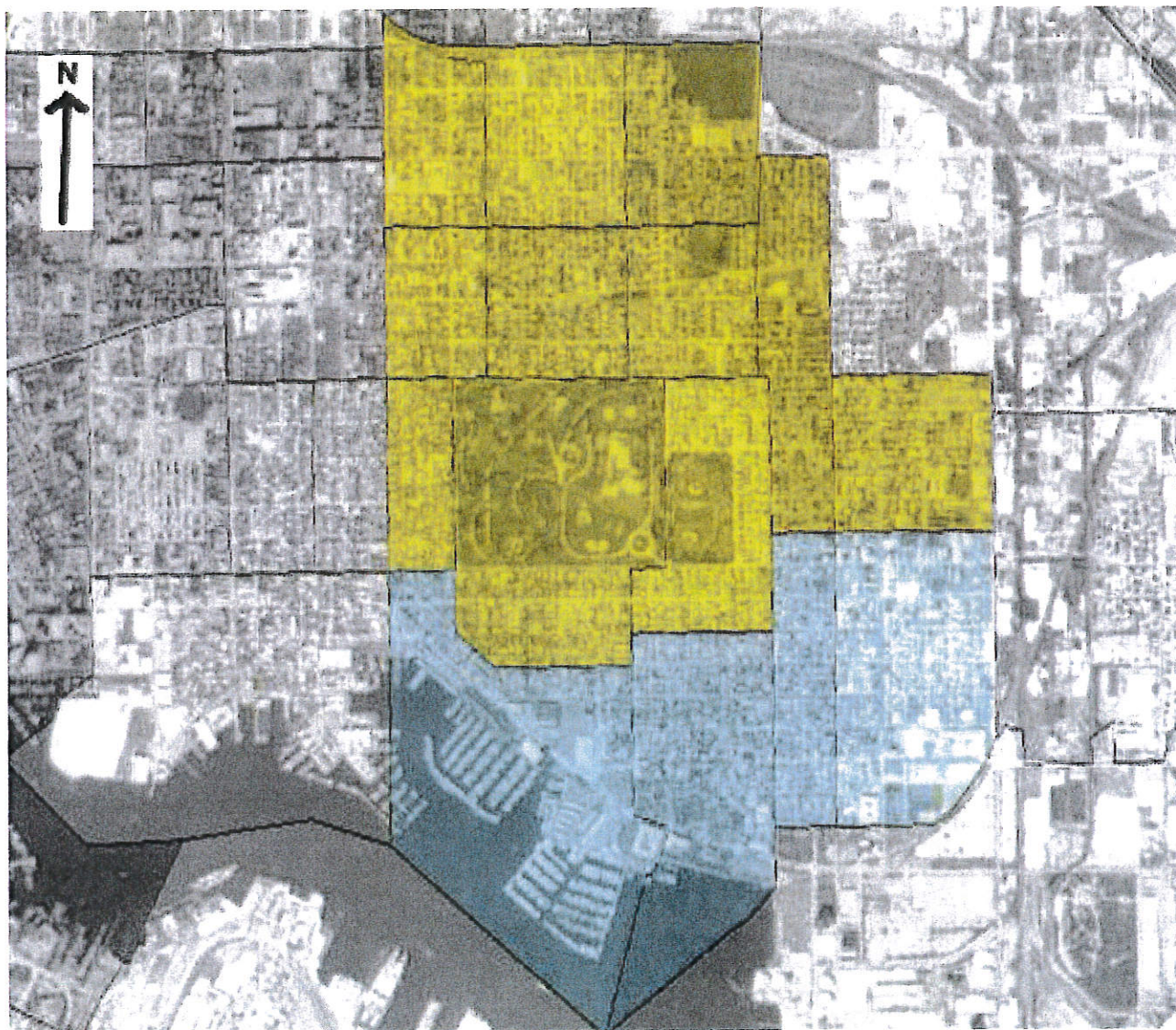


Figure Q-1
[color-coded areas showing "full count" census tract coverage]

SCENARIO No. 1 - The Full-Count

ACS 2006-2010:	PPH Area Total	28,206	CBH Area Total	8,644
-----------------------	-----------------------	---------------	-----------------------	--------------

Population served - The Patterson/Park Highlandtown new route (PPH) would serve over three times as many persons as the current Canton/Brewers Hill (CBH) route. It is important to keep this 3.3:1 ratio in mind when reviewing the relative percentages below - in terms of the actual numbers of census tract residents represented by the percentages.

Commute by Car - 30% of PPH residents and 59% of CBH residents commute by car, with 7% PPH and 3% CBH residents carpooling with others. 10% of PPH residents use public transportation for their commute, as compared to 4% of CBH residents. In occupied housing units, 11% of PPHers have no vehicle, while 6% of CBHers have no vehicle. On the other hand, 8%, 9%, and 4% fewer of PPHers have, respectively, one, two, or three vehicles when compared to CBH residents.

Income Levels - PPH households earn significantly less income than their CBH counterparts. PPHers earn less than \$10,000 a year at 3.1 times the percentage of CBHers. At the higher end, CBHers earn between \$75,000 and more than \$200,000 a year at almost three times the proportion of PPHers. In the ranges of income between the two extremes, PPHers and CBHers earn at roughly the same percentage rate, with CBHers pulling significantly ahead above \$50,000.

Unemployment - 7.0% of PPHers are unemployed, as compared to 3.0% of CBHers.

Poverty - The PPH families in nine of the eleven census tracts have incomes below the federal poverty level at 60%, 36%, 32%, 27%, 25%, 25%, 24%, 17%, and 5%, with no such families in the other two census tracts. In two of the four CBH census tracts, only 3% and 2% of the families have incomes below the federal poverty level, with no such families in the other two census tracts.

Age of Populations - PPH residents tend to be younger than CBH residents. Up through the age of 19, there is a substantially higher percentage of PPH relative to CBH residents. CBH residents have a larger percentage than PPH residents above the age of 64. In the peak employment years, CBH leads PPH in percentage for the 25 to 34 age group, while PPH leads CBS in the 45 to 59 age range. The percentages are close in the 20 to 24, 35 to 44, and 60 to 64 age groups.

Place of Birth - 83% of PPHers and 91% of CBHers were born in the US. 11% of PPHers and 5% of CBHers are not US citizens.

Renters - Both PPH and CBH have roughly the same percentage of renters (17% and 18%, respectively). Median rents paid by PPHers range from \$680 to \$1,682, the majority coming in under \$1,000. For CBHers, the range is from \$1,363 to \$1,473.

Educational Attainment - For those persons over 25, 9% of PPHers and 5% of CBHers have less than a 9th grade education. 14% of PPHers and 8% of CBHers have some high school. 16% of PPHers and 13% of CBHers have a high school diploma. On the other hand, while about 3% of each group have an associate's degree, 10% of PPHers have a bachelor's degree, compared to 27% of the CBHers. 8% of PPHers have a graduate or professional degree, compared to 19% of CBHers.

US Census 2010:	PPH Area Total	28,909	CBH Area Total	10,495
------------------------	-----------------------	---------------	-----------------------	---------------

Ethnicity - 16% of PPH residents and 6% of CBH residents are Hispanic.

Race - 46% of PPH residents and only 4% of CBH residents are black. On the other hand, 40% of people in PPH and 87% of CBH people are white. The two areas' percentages of all other races are 14% for PPH and 9% for CBH.

Scenario No. 2 [The Closer Areas] - *gray background census tracts removed:*

PATTERSON PARK/HIGHLANDTOWN AREA

Census Tract 102, Baltimore city
Census Tract 103, Baltimore city
Census Tract 105, Baltimore city
Census Tract 601, Baltimore city
Census Tract 602, Baltimore city
Census Tract 603, Baltimore city
Census Tract 701, Baltimore city
Census Tract 702, Baltimore city
Census Tract 703, Baltimore city
Census Tract 2608, Baltimore city
Census Tract 2610, Baltimore city

CANTON/BREWERS HILL AREA

Census Tract 101, Baltimore city
Census Tract 104, Baltimore city
Census Tract 2609, Baltimore city
Census Tract 2611, Baltimore city

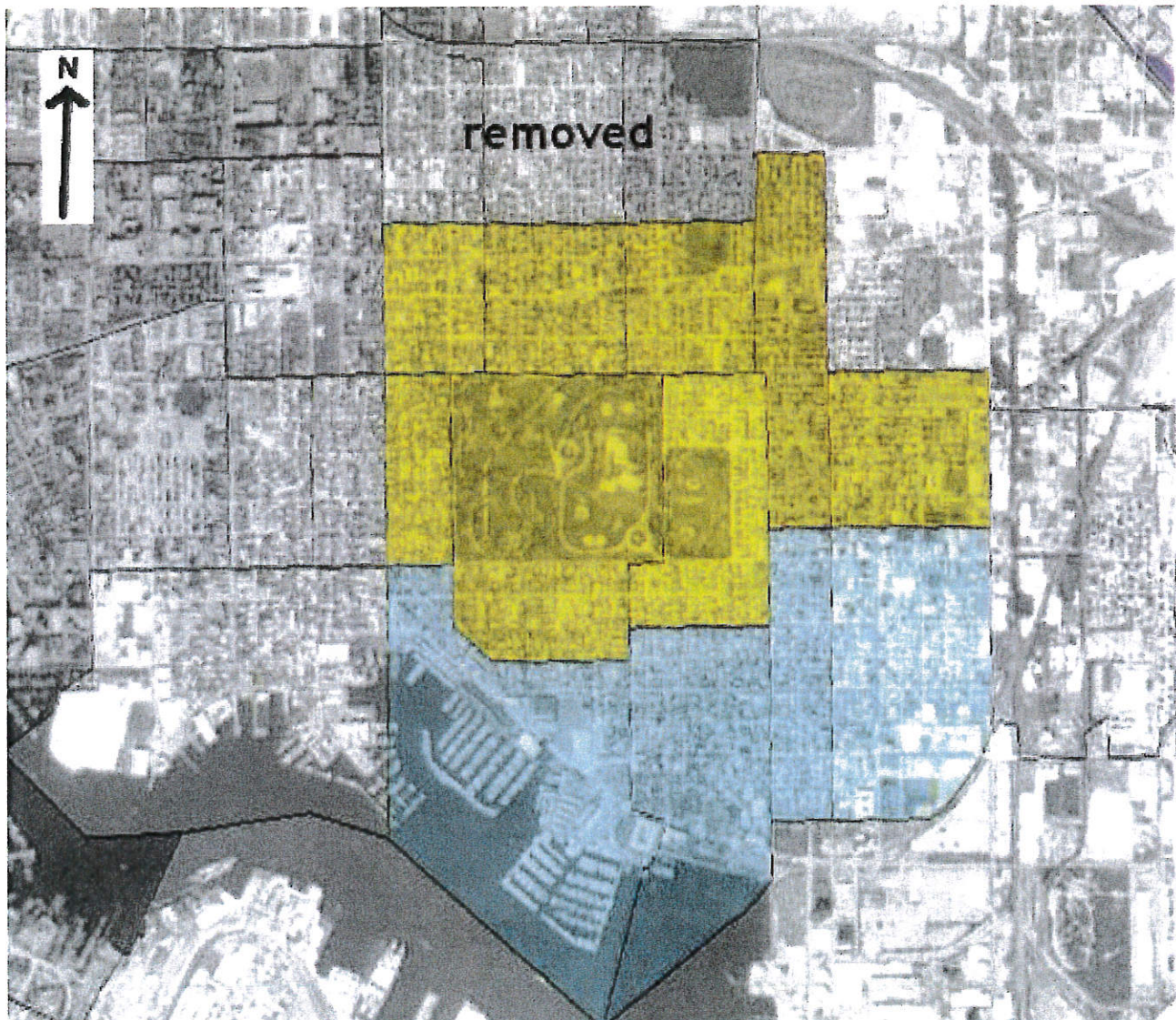


Figure Q-2
[color-coded areas showing "closer areas" census tract coverage]

SCENARIO No. 2 - The Closer Areas

ACS 2006-2010:	PPH Area Total	20,967	CBH Area Total	8,644
-----------------------	-----------------------	---------------	-----------------------	--------------

Population served - The Patterson/Park Highlandtown new route (PPH) would serve more than twice as many persons as the current Canton/Brewers Hill (CBH) route. It is important to keep this 2.4:1 ratio in mind when reviewing the relative percentages below - in terms of the actual numbers of census tract residents represented by the percentages.

Commute by Car - 35% of PPH residents and 59% of CBH residents commute by car, with 9% PPH and 3% CBH residents carpooling with others. 10% of PPH residents use public transportation for their commute, as compared to 4% of CBH residents. In occupied housing units, 11% of PPHers have no vehicle, while 6% of CBHers have no vehicle. On the other hand, 7%, 7%, and 4% fewer of PPHers have, respectively, one, two, or three vehicles when compared to CBH residents.

Income Levels - PPH households earn significantly less income than their CBH counterparts. PPHers earn less than \$10,000 at more than twice the percentage of CBHers. At the higher end of the income spectrum, CBHers earn between \$75,000 and more than \$200,000 a year at double the proportion of PPHers. In the ranges of income between the two extremes, PPHers and CBHers earn at about the same percentage rate, with CBHers pulling significantly ahead above \$50,000.

Unemployment - 6.3% of PPHers are unemployed, as compared to 3.0% of CBHers.

Poverty - The PPH families in six of the eight census tracts have incomes below the federal poverty level at 36%, 32%, 27%, 25%, 17%, and 5%, with no such families in the other two census tracts. In two of the four CBH census tracts, only 3% and 2% have incomes below the federal poverty level, with no such families in the other two census tracts.

Age of Populations - PPH residents tend to be younger than CBH residents. Up through the age of 19, there is a substantially higher percentage of PPH relative to CBH residents. CBH residents have a larger percentage than PPH residents above the age of 64. In the peak employment years, CBH leads PPH in percentage for the 25 to 34 age group, while PPH leads CBS in the 45 to 59 age range. The percentages are close in the 20 to 24, 35 to 44, and 60 to 64 age groups.

Place of Birth - 79% of PPHers and 91% of CBHers were born in the US. 14% of PPHers and 5% of CBHers are not US citizens.

Renters - Both PPH and CBH have roughly the same percentage of renters (16% and 18%, respectively). Median rents paid by PPHers range from \$748 to \$1,682, the majority coming in over \$1,100. For CBHers, the range is from \$1,363 to \$1,473.

Educational Attainment - For those persons over 25, 8% of PPHers and 5% of CBHers have less than a 9th grade education. 12% of PPHers and 8% of CBHers have some high school. 15% of PPHers and 13% of CBHers have a high school diploma. On the other hand, while about 3% of each group have an associate's degree, 13% of PPHers have a bachelor's degree, compared to 27% of the CBHers. 10% of PPHers have a graduate or professional degree, compared to 19% of CBHers.

US Census 2010:	PPH Area Total	21,128	CBH Area Total	10,495
------------------------	-----------------------	---------------	-----------------------	---------------

Ethnicity - 21% of PPH residents and 6% of CBH residents are Hispanic.

Race - 30% of PPH residents and only 4% of CBH residents are black. On the other hand, 53% of people in PPH and 87% of CBH people are white. The two areas' percentages of all other races are 17% for PPH and 9% for CBH.

Scenario No. 3 [Discounting the Shared Areas] - *gray background census tracts removed:*

PATTERSON PARK/HIGHLANDTOWN AREA

Census Tract 102, Baltimore city
Census Tract 103, Baltimore city
Census Tract 105, Baltimore city
Census Tract 601, Baltimore city
Census Tract 602, Baltimore city
Census Tract 603, Baltimore city
Census Tract 701, Baltimore city
Census Tract 702, Baltimore city
Census Tract 703, Baltimore city
Census Tract 2608, Baltimore city
Census Tract 2610, Baltimore city

CANTON/BREWERS HILL AREA

Census Tract 101, Baltimore city
Census Tract 104, Baltimore city
Census Tract 2609, Baltimore city
Census Tract 2611, Baltimore city

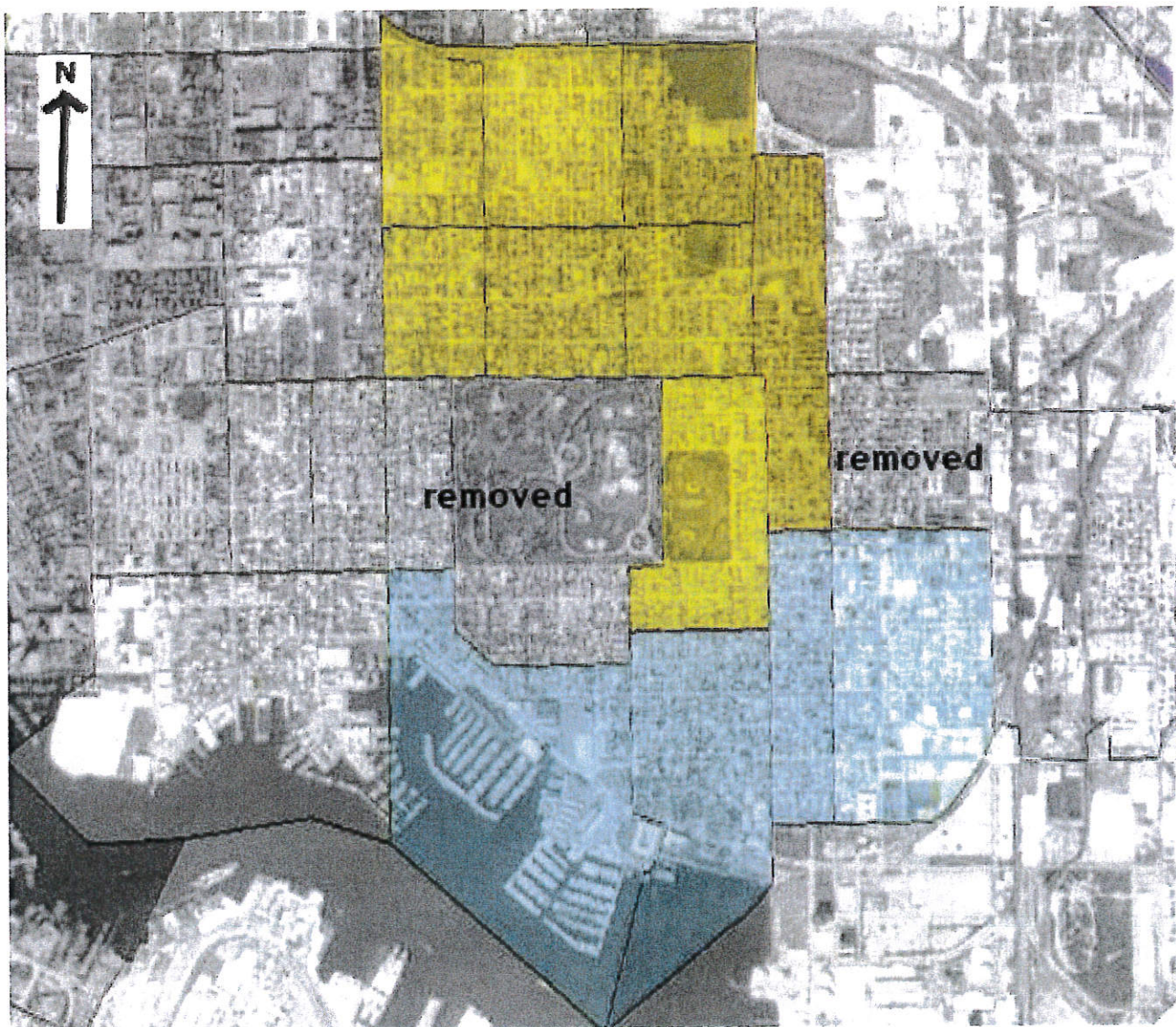


Figure Q-3
[color-coded areas showing "shared areas" census tract coverage]

SCENARIO No. 3 - Discounting the Shared Areas

ACS 2006-2010:	PPH Area Total	21,190	CBH Area Total	8,644
-----------------------	-----------------------	---------------	-----------------------	--------------

Population served - The Patterson/Park Highlandtown new route (PPH) would serve more than twice as many persons as the current Canton/Brewers Hill (CBH) route. It is important to keep this 2.5:1 ratio in mind when reviewing the relative percentages below - in terms of the actual numbers of census tract residents represented by the percentages.

Commute by Car - 25% of PPH residents and 59% of CBH residents commute by car, with 7% PPH and 3% CBH residents carpooling with others. 13% of PPH residents use public transportation for their commute, as compared to 4% of CBH residents. In occupied housing units, 13% of PPHers have no vehicle, while 6% of CBHers have no vehicle. On the other hand, 8%, 11%, and 4% fewer of PPHers have, respectively, one, two, or three vehicles when compared to CBH residents.

Income Levels - PPH households earn significantly less income than their CBH counterparts. PPHers earn less than \$10,000 a year at 2.7 times the percentage of CBHers. At the higher end of the income spectrum, CBHers earn between \$75,000 and more than \$200,000 a year at more than three times the proportion of PPHers. In the ranges of income between the two extremes, PPHers and CBHers earn at about the same percentage rate, with CBHers pulling significantly ahead above \$50,000.

Unemployment - 8.0% of PPHers are unemployed, as compared to 3.0% of CBHers.

Poverty - The PPH families in the eight census tracts have incomes below the federal poverty level at 60%, 36%, 27%, 25%, 25%, 24%, 17%, and 5%. In two of the four CBH census tracts, only 3% and 2% have incomes below the federal poverty level, with no such families in the other two census tracts.

Age of Populations - PPH residents tend to be younger than CBH residents. Up through the age of 19, there is a substantially higher percentage of PPH relative to CBH residents. CBH residents have a larger percentage than PPH residents above the age of 64. In the peak employment years, CBH leads PPH in percentage for the 25 to 34 age group, while PPH leads CBS in the 45 to 59 age range. The percentages are close in the 20 to 24, 35 to 44, and 60 to 64 age groups.

Place of Birth - 84% of PPHers and 91% of CBHers were born in the US. 10% of PPHers and 5% of CBHers are not US citizens.

Renters - Both PPH and CBH have roughly the same percentage of renters (17% and 18%, respectively). Median rents paid by PPHers range from \$680 to \$1,216, most of them coming in under \$1,000. For CBHers, the range is from \$1,363 to \$1,473.

Educational Attainment - For those persons over 25, 10% of PPHers and 5% of CBHers have less than a 9th grade education. 15% of PPHers and 8% of CBHers have some high school. 17% of PPHers and 13% of CBHers have a high school diploma. On the other hand, while about 3% of each group have an associate's degree, 6% of PPHers have a bachelor's degree, compared to 27% of the CBHers. 6% of PPHers have a graduate or professional degree, compared to 19% of CBHers.

US Census 2010:	PPH Area Total	22,330	CBH Area Total	10,495
------------------------	-----------------------	---------------	-----------------------	---------------

Ethnicity - 15% of PPH residents and 6% of CBH residents are Hispanic.

Race - 57% of PPH residents and only 4% of CBH residents are black. On the other hand, 30% of people in PPH and 87% of CBH people are white. The two areas' percentages of all other races are 13% for PPH and 9% for CBH.

Scenario No. 4 [Combined Closer and Discounted Shared Areas] - *gray background census tracts removed:*

PATTERSON PARK/HIGHLANDTOWN AREA

Census Tract 102, Baltimore city
Census Tract 103, Baltimore city
Census Tract 105, Baltimore city
Census Tract 601, Baltimore city
Census Tract 602, Baltimore city
Census Tract 603, Baltimore city
Census Tract 701, Baltimore city
Census Tract 702, Baltimore city
Census Tract 703, Baltimore city
Census Tract 2608, Baltimore city
Census Tract 2610, Baltimore city

CANTON/BREWERS HILL AREA

Census Tract 101, Baltimore city
Census Tract 104, Baltimore city
Census Tract 2609, Baltimore city
Census Tract 2611, Baltimore city

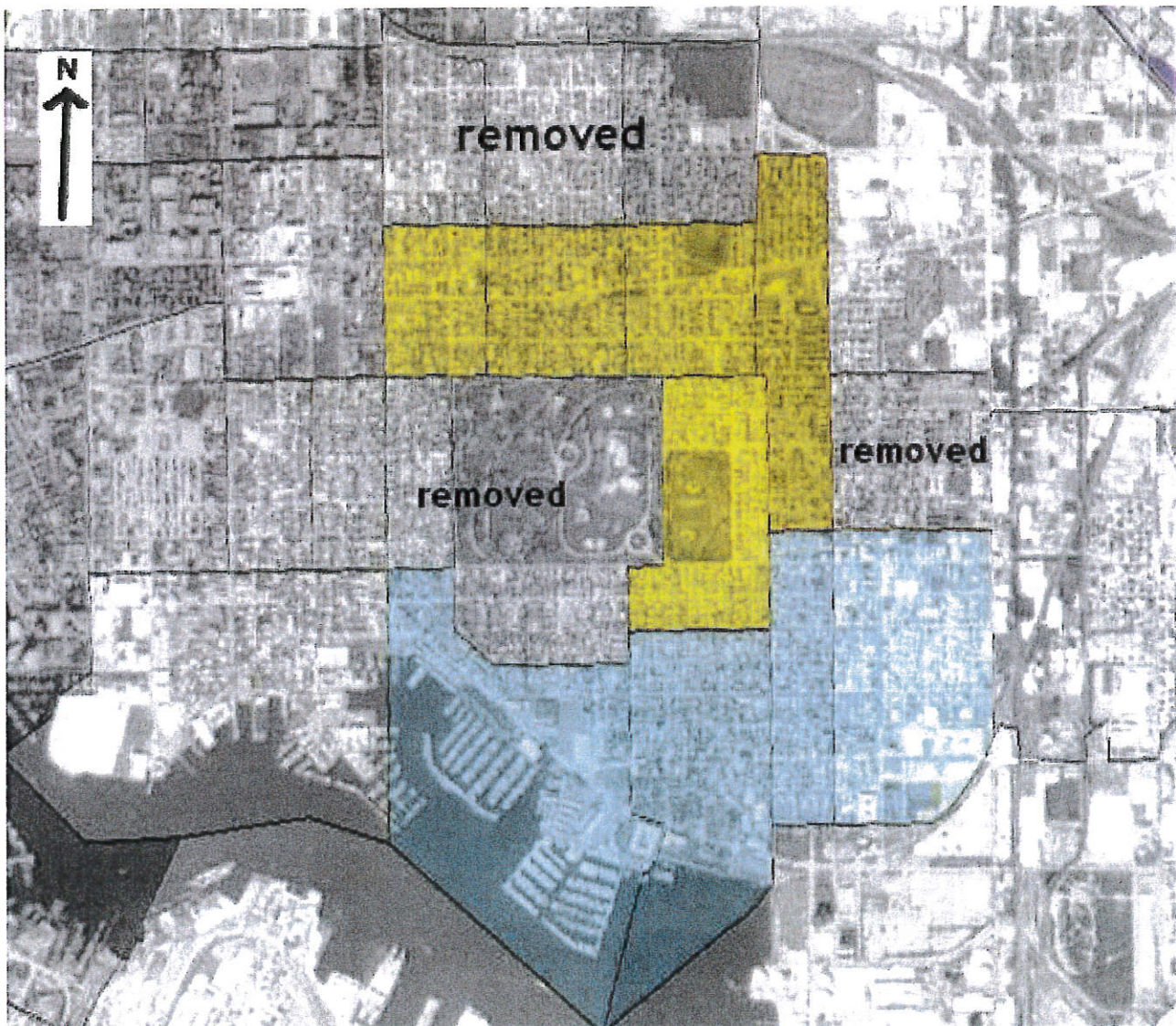


Figure Q-4
[color-coded areas showing "closer" and "shared" areas census tract coverage]

SCENARIO No. 4 - Combined Closer and Discounted Shared Areas

ACS 2006-2010:	PPH Area Total	13,951	CBH Area Total	8,644
-----------------------	-----------------------	---------------	-----------------------	--------------

Population served - The Patterson/Park Highlandtown new route (PPH) would serve 1.6 times as many persons as the current Canton/Brewers Hill (CBH) route. It is important to keep this 1.6:1 ratio in mind when reviewing the relative percentages below - in terms of the actual numbers of census tract residents represented by the percentages.

Commute by Car - 30% of PPH residents and 59% of CBH residents commute by car, with 8% PPH and 3% CBH residents carpooling with others. 13% of PPH residents use public transportation for their commute, as compared to 4% of CBH residents. In occupied housing units, 12% of PPHers have no vehicle, while 6% of CBHers have no vehicle. On the other hand, 8%, 9%, and 4% fewer of PPHers have, respectively, one, two, or three vehicles when compared to CBH residents.

Income Levels - PPH households earn significantly less income than their CBH counterparts. PPHers earn less than \$10,000 a year at more than double the percentage of CBHers. At the higher end of the income spectrum, CBHers earn between \$75,000 and more than \$200,000 a year at more than double the proportion of PPHers. In the ranges of income between the two extremes, CBHers pull significantly ahead above \$35,000.

Unemployment - 7.4% of PPHers are unemployed, as compared to 3.0% of CBHers.

Poverty - The PPH families in the five census tracts have incomes below the federal poverty level at 36%, 27%, 25%, 17% and 5%. In two of the four CBH census tracts, only 3% and 2% have incomes below the federal poverty level, with no such families in the other two census tracts.

Age of Populations - PPH residents tend to be younger than CBH residents. Up through the age of 19, there is a substantially higher percentage of PPH relative to CBH residents. CBH residents have a larger percentage than PPH residents above the age of 64. In the peak employment years, CBH leads PPH in percentage for the 25 to 34 age group, while PPH leads CBS in the 45 to 59 age range. The percentages are close in the 20 to 24, 35 to 44, and 60 to 64 age groups.

Place of Birth - 79% of PPHers and 91% of CBHers were born in the US. 14% of PPHers and 5% of CBHers are not US citizens.

Renters - Both PPH and CBH have roughly the same percentage of renters (15% and 18%, respectively). Median rents paid by PPHers range from \$748 to \$1,216. For CBHers, the range is from \$1,363 to \$1,473.

Educational Attainment - For those persons over 25, 9% of PPHers and 5% of CBHers have less than a 9th grade education. 13% of PPHers and 8% of CBHers have some high school. 16% of PPHers and 13% of CBHers have a high school diploma. On the other hand, while about 3% of each group have an associate's degree, 9% of PPHers have a bachelor's degree, compared to 27% of the CBHers. 8% of PPHers have a graduate or professional degree, compared to 19% of CBHers.

US Census 2010:	PPH Area Total	14,459	CBH Area Total	10,495
------------------------	-----------------------	---------------	-----------------------	---------------

Ethnicity - 21% of PPH residents and 6% of CBH residents are Hispanic.

Race - 39% of PPH residents and only 4% of CBH residents are black. On the other hand, 44% of people in PPH and 87% of CBH people are white. The two areas' percentages of all other races are 17% for PPH and 9% for CBH.

3) Legal Basis for Changing the Stations

Stations should be located nearest to those households with the greatest need for public transportation. As stated on page 30 of the 2002 Technical Report on the Baltimore Region Rail System Plan "...households with median income <\$25,000 are considered to be low-income households and are recognized to be the households with the greatest need for basic mobility."

To best locate the stations for the riding public in Southeast Baltimore, we need to take a deeper look at both environmental justice and equity.

What is Environmental Justice?

The MTA has addressed environmental justice in "Environmental Resources and Effects" in Chapter 4 of the AA/DEIS (September 2008); and in the Environmental Justice Technical Report, the Stations Technical Report, and the Neighborhood Effects Technical Report, all from April 2008, which accompany it.

LAW: Executive Order 12898²⁰ (effectuated by USDOT Order 5610.2 on Environmental Justice²¹) - calls on each federal agency to achieve environmental justice by identifying and addressing disproportionately high and adverse human health and environmental effects, including interrelated social and economic effects of its programs, policies, and activities on minority and low-income transit riders - in this case, as a result of changes to transit service. [underscoring added]

What is Equity?

The MTA has addressed equity in "Evaluation of Alternatives," Chapter 6 of the AA/DEIS, which also references the Chapter 4 consideration of environmental justice, and the travel demand forecasting to be found in the Travel Demand Forecast Technical Report (February 2008). Alternatives are evaluated according to six Red Line Corridor Transit Project Goals and their sixteen objectives [AA/DEIS - Table 1-1 at page 3 and Table 6-2 at page 115].

LAW: Title VI of the Civil Rights Act of 1964²² (effectuated by USDOT regulation, 49 CFR part 21²³) - prohibits recipients of federal financial assistance from discriminating based on race, color, or national origin in their programs or activities by having a disparate impact on those "protected" populations - in this case, as a result of changes to transit service - and ensures that the end result is equitable service. [underscoring added]

The guidance and instructions necessary to comply with these environmental justice and equity legal requirements is contained in the Federal Transit Administration (FTA) Circular 4702.1A (2007)²⁴ (although proposed strengthening revisions are being

considered at this very time). Let's look at these two program requirements below.

a) **Assessing Environmental Justice: Analysis and Comparison of Data Obtained from All Four Scenarios**

If we group together each category of data from all four census data scenarios laid out in detail above, we are able to draw the following conclusions:

Type of Data	Patterson Park /Highlandtown Area	Canton/Brewers Hill Area
Totals: ACS 2006-10	28,206 / 20,967 / 21,190 / 13,951 [popul. for each scenario]	8,644 [popul. for all four scenarios]
Transportation	Fewer car owners and car commuters; more use of public transportation.	More car owners and car commuters; less use of public transportation.
Income	More low earners, few very high earners.	Few low earners, many high earners.
Unemployment	Higher rate of unemployment.	Lower rate of unemployment.
Poverty	Many families living under the federal poverty line.	Few families living under the federal poverty line.
Age	Much larger proportion of and many more young people; fewer older persons.	Fewer young people; many more older persons.
Birthplace	Somewhat larger proportion born outside the US; larger proportion who are not US citizens.	Somewhat smaller proportion born outside the US; smaller proportion who are not US citizens.
Renting	Paying significantly less for lowest rental.	Paying significantly more for lowest rental.
Educational Attainment	A larger proportion without a high school degree.	A much larger proportion with a bachelor's degree, and professional degrees.
Totals: Census 2010	28,909 / 21,128 / 22,330 / 14,459 [popul. for each scenario]	10,495 [popul. for all four scenarios]
Ethnicity	Larger proportion of Hispanic people.	Smaller proportion of Hispanic people.
Race	Much larger proportion of persons who are black.	Mostly white. Small proportion of persons who are black.

Similarly to our census summary above, using the key indicator of personal vehicle ownership based on 2007 data from the Baltimore Neighborhoods Indicator Alliance (BNIA), the MTA in the AA/DEIS, Chapter 1 "Purpose and Need," on page 4, in Figures 1-2 and 1-3, notes there is much less vehicle ownership in areas similar to those located within the PPH area above: 57% of residents in "Madison East End" and 44% of those living in "Patterson Park North and East" do not own a vehicle. The

percentages not owning a vehicle are much lower in the "Canton" (28%) and "Brewers Hill/Highlandtown" (34%) neighborhoods, which resemble the CBH area above. The two tables below (one shows persons with disabilities, the other shows percentages of workers using transit) follow the pattern of data from the four scenarios:

<u>Type of Data</u>	<u>Patterson Park /Highlandtown Area</u>	<u>Canton/Brewers Hill Area</u>
<i>Totals - only available from the 2000 Census²⁵</i>	28,033 / 19,993 / 22,108 / 14,068 [popul. for each scenario]	8,745 [popul. for all four scenarios]
Persons with one, two, or more types of disability	Larger numbers of persons with disabilities between the ages of 16 and 64 (by scenario: 5,557 / 3,733 / 4,478 / 2,654)	Smaller number of persons with disabilities between the ages of 16 and 64 (1,375)

<i>Data from Center for Neighborhood Technology's Housing and Transportation Affordability Index [2010]²⁶</i>	<u>Patterson Park/ Highlandtown Area</u> (for all four scenarios)	<u>Canton/Brewers Hill Area</u>
Percent of workers using transit (by census tracts, and the census blocks within them)	701/702/703 - 16% to 63% 601/602/603 - 18% to 50% 102/103/105 - 16% to 27% 2608/2610 - 17% to 41%	101/104 - 8.5% to 17% 2609/2611 - 8.2% - 18%

If the currently proposed Boston Street (Canton) route were to be replaced by the Eastern Avenue route, what would this mean in terms of public transportation for the persons living around the Patterson Park and Highlandtown areas?

- 1) The population served which currently uses public transportation in that area would increase from 375 to a range of 1,700 to 2,900.
- 2) The total number of persons potentially served in that area would increase from 8,700 to a range of 14,000 to 28,000.
- 3) The number of Hispanic persons potentially served in that area would increase from 640 to a range of 3,000 to 4,700.
- 4) The number of black persons potentially served in that area would increase from 435 to a range of 5,600 to 13,700.
- 5) The percent of families potentially served in that area who live below the federal poverty level would increase from a range of 2-3 % to a range of 5-60%.

Geographical Area:	Patterson Park/Highlandtown	Canton/Brewers Hill
<u>Future Use of the Red Line:</u>	Residents much more likely to need, use, and benefit from light rail public transportation.	Residents not as likely to switch from personal cars to use of light rail public transportation.

According to the forecast data developed by the Baltimore Metropolitan Council (BMC) [its "Round 7-C, Cooperative Forecasting Process" updated in 2010 and the identical Round 7-B updated in 2009²⁷], the population changes (mostly increases) projected for the 25 years from 2010 to 2035 are small, except in a few cases involving the geographical areas around the Johns Hopkins Hospital area, Upper Fells Point, South Highlandtown, and Brewers Hill. These are all outliers, with significant - and in the case of Hopkins, South Highlandtown, and Brewers Hill - substantial projected increases in population, households, and employment. It appears that these projections are based upon land areas slated for development in the future. However, in the case of South Highlandtown and Brewers Hill, the projections are based upon the likelihood of future transit-oriented development (TOD), which is tied to the previously chosen Locally-Preferred Alternative (LPA) selected for the Red Line in 2009 by Governor Martin O'Malley.

It is no coincidence for these BMC projections that the LPA selected was Alternative 4C, which proposes to follow the Canton/Brewers Hill alignment along Boston Street, as discussed above. Along with other data, the projections may have been used to justify the selection of the LPA, while their accuracy in the long run may have assumed the selection of the same LPA. If this circular reasoning process was used, it would undercut the value of these projections as valid and meaningful planning data.

According to the Red Line AA/DEIS Environmental Justice Technical Report on page 32:

The ultimate purposes of the environmental justice analysis are to identify any disproportionately high and adverse effects on environmental justice populations, ensure that environmental justice populations are not denied project benefits, and to ensure that environmental justice populations have received full and fair access to project-related public involvement.

As part of the AA/DEIS environmental justice analysis, 223 census blocks (all or part of 73 census tracts) from the 2000 US Census were identified and studied. Of these 174 census blocks met the environmental justice (EJ) thresholds - that is, either contained minority populations of 50% or greater, or low-income populations of 23-24% or greater, or both.

Of the 49 census blocks (out of part or all of 30 census tracts) within Baltimore City and Baltimore County which were considered not to meet or qualify as being within the EJ threshold, 20 of them (from part or all of nine census tracts) - or over 40% of the City/County non-qualifying census blocks - were located in the Canton and Highlandtown areas. Furthermore:

- Depending on which of the four Scenarios above is followed, four to nine of these non-qualifying census blocks (from part or all of 2 to 5 census tracts) were located in the PPH area used in the data analysis above.
- By way of contrast, all 11 census blocks from the four census tracts located in the CBH area used above were considered as non-qualifying.

The Environmental Justice Technical Report did not make this smaller-cell comparison of the two areas (around Eastern Avenue and Boston Street) in Southeast Baltimore. But the great geographical separation between the two sets of proposed alternatives begs for such a comparative analysis (see page 5 above). Using this comparison, we can demonstrate a significant difference: a much higher rate of low-income and minority population existing in the PPH area as compared to the CBH area. Fortunately, the data used in this document in the four scenarios are more up-to-date and detailed than the 2000 US Census data used as a basis for the Red Line Environmental Justice Technical Report.

The EJ Technical Report cites on page 19 the following acceptable method authorized by the Federal Transit Administration to determine the minority EJ threshold: "the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis" [Council on Environmental Quality - "Environmental Justice - Guidance under the National Environmental Policy Act" (1997) at page 25²⁸]. Comparing the Patterson Park/Highlandtown (PPH) [yellow] area with the Canton/Brewers Hill (CBH) [blue] area would qualify as one way to determine this EJ threshold of "meaningfully greater." Using this standard, in the PPH area, for Scenarios #1 through #4, black residents number, respectively, 46%, 30%, 57%, and 39%; and Hispanic residents number, respectively, 16%, 21%, 15% and 21%. On the other hand, in all Scenarios for the CBH area, black residents number 4% and Hispanic residents (of all races) number 6%.

Regarding low-income status, using the accepted criterion of at or below the federal poverty guidelines, of the census tracts in Scenarios #1 through #4 of the PPH area, respectively, 7 out of 11, 4 out of 8, 6 out of 8, and 3 out of 5 qualify as meeting the EJ threshold of 23-24% or greater. No census tracts in the CBH area meet this threshold.

A range of comparisons between appropriate units of geographic analysis reveals the following contrasts:

- 1) Compared to the CBH area (6%), the PPH area in all four Scenarios (15%-21%) has a significantly higher percentage of Hispanic residents.
- 2) Compared to the BMC Metro area as a whole (5%), the PPH area in all four Scenarios (15%-21%) has a significantly higher percentage of Hispanic residents.
- 3) Compared to the BMC Metro area as a whole (29%), the PPH area in three of the Scenarios (Scenario #2 is the exception) has a significantly higher percentage of black residents (39%-57%).
- 4) Compared to the Baltimore City/Baltimore County jurisdictions (43% black; 49% white) through which the Red Line is currently slated to go, the CBH area has a significantly lower percentage of black residents (4%), and a significantly higher percentage of white residents (87%).

Seen from this latter perspective, the population of the PPH area meets the EJ threshold to a much greater extent than stated in the 2008 EJ evaluation presented by the AA/DEIS and its Environmental Justice Technical Report.

We have established above that the population living in the Patterson Park/Highlandtown area is an environmental justice population. To leave the Red Line routed on Boston Street instead of Eastern Avenue would therefore deny to the people from the PPH area the benefits resulting from the Red Line project. This is contrary to the purpose to "ensure that environmental justice populations are not denied project benefits" as stated in the MTA's Environmental Justice Technical Report (see page 35 above). As stated by the AA/DEIS at page 61:

The potential that environmental justice populations would be denied the benefits of the proposed transit system was analyzed. As described below, the main benefits are improved mobility and faster travel times to locations along the corridor.

...

Environmental justice populations would not be denied the benefit of access to a station. The vast majority of the neighborhoods in the study area, most of which contain environmental justice populations, are within a half mile of a proposed Red Line Station.

Based on data from the Environmental Justice Technical Report, Figure R directly below is a graphic representation of just such a denial, which would exist if the currently proposed Canton Route (CBH area) were built instead of the Eastern Route (PPH area) - [these two routes are indicated in red on the graphic below]:

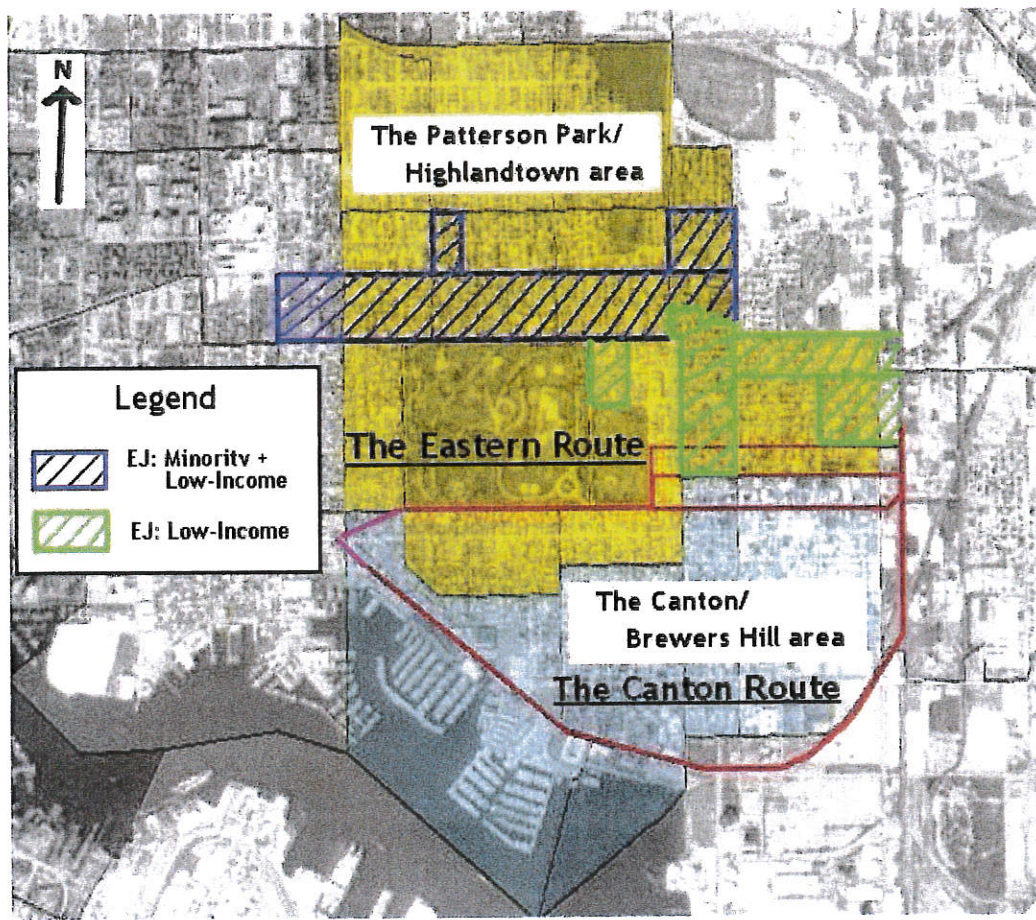


Figure R

Looking back at Fig. L-2 on page 13 above, it is clear that the environmental justice populations above are not within a half mile there of either blue dot indicating the Canton or Canton Crossing station proposed for the Canton Route. Such a denial would not only include the service benefits resulting from nearby public transportation (faster, more efficient service throughout the fourteen miles of the Red Line), but would also include health benefits, which will be discussed below under health equity.

b) Putting Some Specificity into Equity in Southeast Baltimore

What is equity? It is not equality. It is fairness. What does that mean when we look at a basic government service such as public transportation? It means that people are served fairly all across the geographical area, not necessarily to equal extents. The concept "equity" is essentially not explored in any depth in the AA/DEIS. It is mentioned in passing only a few times, and then only in Chapter 6.

i) Transit Service Equity

Fair service means that those who need or could use the service the most are given the first and easiest access to it, over others who need or could use it less. Equity is

not just some side issue, a word to be intoned, a giving of lip service, or a box to be checked off in the course of a review of plans for a federally-funded transit project. It is central to the life and future of any substantial public transportation project and the metropolitan area it serves.

In planning this major public transportation project of the Red Line, we need to remember that we are planning not just for ourselves now, but for our children, and their children, and their descendants over time. These are major public projects, which are built to last, which cost a great deal of money, and which take a long time to plan, design, and build - before they can be put into operation. So, we have to look beyond today's adults to tomorrow's adults and children and do our best to put in place something which will serve them both optimally and equitably. In short, it is essential, from the outset, to "do it right."

Since the Red Line project has already received and will in the future be receiving federal funds, federal law requires that the justification for the project be evaluated. Among other things, such evaluation requires the federal Secretary of Transportation to:

...analyze, evaluate, and consider --

(G) the degree to which the project increases the mobility of the public transportation dependent population or promotes economic development; [and]

(H) population density and current transit ridership in the transportation corridor.... [The "New Starts" program - Title 49 United States Code, Sec. 5309(d)(3)]

Some of this language is quite clear - increasing mobility for persons who depend on public transportation. "Economic development," a paired set of terms we hear frequently, however, is not necessarily so clear. The first thought may be that it only refers to bringing new business to the geographical area being served, such as large new enterprises and housing developments. However, the terms certainly also apply to small business development, and to improvement of the economic situation of individuals and families - in terms of increased job possibilities, employment options, and opportunities to obtain needed training and education. As pointed out on page 61 in Chapter 4 of the AA/DEIS, "...the Red Line would provide economic benefits by improving transit access and mobility for the work force and consumers within the corridor." It would also "create permanent jobs to operate and maintain the system...[and a] large number of temporary jobs... for several years during construction." Viewed in this broader way, economic development provides a major rationale for increasing the mobility of those who depend on public transportation. We can thus understand a sense in which these two requirements of the federal New Starts program - increased mobility and economic development - are intertwined and support each other. In fact, currently the Federal Transit Administration has

been considering modifying the cost-effectiveness evaluation method to give extra weight to project trips made by transit-dependent persons. As part of this same effort, it is also seeking to expand the "economic development" criterion in the New Starts law to consider social equity impacts of major transit investments. [See Docket No. FTA-2010-0009²⁹]

Looking at existing data, as we have done above, enables us to get some sense of which population groups already now and will in the future need and benefit from improved public transportation of the light-rail type represented by the Red Line. What do the above census data make clear? The data make clear that, regardless of which of the four scenarios is chosen, if the Red Line is built closer to Patterson Park and Highlandtown (north of Eastern Avenue), it will serve many more people than would be served by the Canton/Brewers Hill route. The people who live in the Patterson Park/Highlandtown area depend much more upon public transportation than do or will the residents of Canton/Brewers Hill. Compared to CBH residents, a higher proportion of PPH residents cannot afford to own and operate a car, either because they tend to have jobs which are lower paying or they are unemployed. Therefore, public transportation would be much more useful to more of them than it would be for many people from Canton and Brewers Hill.

This is not to say that some people in south Canton or in Brewers Hill would not benefit from public transportation. But, in terms of numbers of people who could be served by public transportation in this area of Southeast Baltimore, public transportation would be beneficial and essential for many more of the people living around Patterson Park and in northern Highlandtown. The route along Boston Street will not offer such service to most of them.

In terms of station location, the residents along the Canton Route south of Eastern Avenue and many of the commercial establishments there would be equally well served whether the rail line goes on Boston Street or along Eastern Avenue. By way of contrast, the existing commercial area in Highlandtown along Eastern Avenue would be much better served by the Eastern Route than by the Canton Route.

The area around the Canton Crossing Station (#17): The only significant economic difference between the two routes will be in the service offered to the commercial area planned to grow around the southernmost end of Conkling Street and the Brewers Hill area, where currently there is only limited commercial activity, despite great past and present hopes for its commercial future. These hopes include the big development plans intended for future commercial uses of the sites around the First Mariner Bank tower, which were described both in the Baltimore Business Journal³⁰ and the Daily Record³¹ (June 7, 2011) and in the Baltimore Sun (June 8³² and December 6,³³ 2011). BCP Investors LLC (which includes the Chesapeake Real Estate Group and Birchwood Capital Partners) have plans to build a shopping center on a 31-acre waterfront site located next to the First Mariner Bank Tower at Canton

Crossing. According to the June 7, 2011 article in the Baltimore Business Journal, [former] "CEO [Ed] Hale [of First Mariner Bancorp had] hoped to create a massive mixed-use community in Canton complete with hotels, offices, shops and restaurants. But the project was delayed because of the recession, and Hale was only able to build a small portion of the project." Some of the acreage involves "land Exxon Mobil is currently cleaning up," which clean-up began in 2001. The Red Line is not essential for this planned development. As pointed out in the Daily Record article, "Residents of Canton have long complained about the lack of retail in their community." Many of those residents can easily reach the site on foot. The location is also ideal for attracting shoppers driving in from elsewhere because of its close location to exits off both Interstate 95 and Interstate 895. Therefore, this Canton Crossing location can be reached without needing to add passenger light rail such as the Red Line.

Furthermore, it should be noted that Fells Point, all the way from Central Avenue in the west to Chester Street in the east, already includes extremely numerous and active commercial enterprises which will be served by the Fells Point portion of the Red Line, and which are located close enough for residents from the west side of Canton who might not choose to walk or drive east to Canton Crossing.

A more balanced and equitable approach to public transportation in the densely populated areas of Southeast Baltimore around Fells Point, Canton, and Highlandtown would be to serve the existing residents of these areas, along with the existing commercial enterprises located there - without routing the rail line, primarily based upon hopes for future development, in an area relatively remote from most residents. The numerous commercial enterprises located along Eastern Avenue in Highlandtown would benefit greatly from the Red Line being routed near there on the surface or in a tunnel underneath, as well as by having a station located near the intersection of Eastern and Ellwood Avenues.

From the point of view of service equity, the Red Line should be routed through and its stations located near those public areas where it will serve the most people, particularly those who depend most upon public transportation. As can be seen above, by every measure used, service equity requires routing the Red Line and its stations along Eastern Avenue instead of along Boston Street, as currently proposed.

ii) Health Equity

There is no better place to look for articulation of health benefits resulting from public transportation than Todd Litman's June 2010 report, commissioned by the American Public Transportation Association (APTA) ["Evaluating Public Transportation Health Benefits," Victoria Transport Policy Institute³⁴ - see www.vtpi.org]. On Page 1 of the 32-page report, Litman condenses his findings into twelve items. The six findings with the most specific application to local populations in the Eastern

Avenue/Boston Street areas are quoted here [numbers added for clarity]:

- 1) High quality public transportation (convenient, comfortable, fast rail and bus transport) and transit oriented development (walkable, mixed-use communities located around transit stations) tend to affect travel activity in ways that provide large health benefits, including reduced traffic crashes and pollution emissions, increased physical fitness, improved mental health, improved basic access to medical care and healthy food and increased affordability which reduces financial stress to lower-income households.
- 2) U.S. Center for Disease Control recommends that adults average at least 22 daily minutes of moderate physical activity, such as brisk walking, to stay fit and healthy. Although less than half of American adults achieve this target, most public transportation passengers do exercise the recommended amount while walking to and from transit stations and stops.
- 3) Neighborhood design features that support transit, such as walkability and mixed land use, also support public health. Of people with safe places to walk within ten minutes of home, 43% achieve physical activity targets, compared with just 27% of less walkable area residents.
- 4) The United States has relatively poor health outcomes and high healthcare costs compared with peers, due in part to high per capita traffic fatality rates and diseases resulting from sedentary living. Public transit improvements can improve health outcomes and reduce healthcare costs.
- 5) Inadequate physical activity contributes to numerous health problems, causing an estimated 200,000 annual deaths in the U.S., and significantly increasing medical costs. Among physically able adults, average annual medical expenditures are 32% lower for those who achieve physical activity targets (\$1,019 per year) than for those who are sedentary (\$1,349 per year).
- 6) Many physically and economically disadvantaged people depend on public transportation to access medical services and obtain healthy, affordable food.

It is clear from the above list that more persons living in the PPH area stand to benefit from public transportation than those from the CBH area. By way of example for item 1) above, on the importance of access to healthy food, the PPH area is host to so-called "food deserts" within four of its census tracts (2610, 601, 701, and 703 - east and north of Patterson Park), while there are no such food deserts at all in the CBH area [map published in the Baltimore Sun , March 5, 2012 - based upon research done by the Johns Hopkins Center for the Liveable Future;³⁵ and see also the Urbanite Magazine - No. 94 - April 2012 - page 33³⁶].

One might also add to the above list an increased opportunity for human connectivity throughout the city and region, increased access to cultural and recreational resources, and easier opportunities for exploring urban neighborhoods. By cutting down on social isolation, such possibilities can certainly enhance residents' health and well-being, and add substantially to the region's livability.

In December of 2011, the Baltimore City Health Department published its latest compilation of health profiles for the City's fifty-five neighborhoods [2011 Baltimore City Neighborhood Health Profiles³⁷]. Each profile contains a detailed list of health outcomes, in which it is compared with the other fifty-four neighborhoods. For each neighborhood, the list contains Life Expectancy, Avertable Deaths, and Years of Potential Life Lost (YPLL) per 10,000 residents, along with fifteen indices of Mortality, and four indices of Maternal and Child Health. As shown in the graphics below, three of the neighborhoods encompass the areas to be served in Southeast Baltimore by the Red Line: Patterson Park North & East (Figure S), Canton (Figure T), and Highlandtown (Figure U). The boundaries used by the Baltimore City Health Department for these neighborhood health profiles follow those used by the Baltimore Neighborhood Indicators Alliance (BNIA) for its Community Statistical Areas (CSAs).

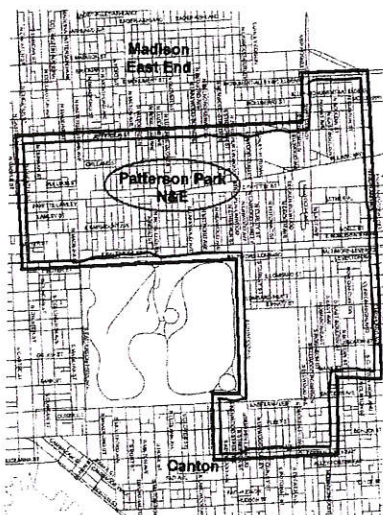


Figure S

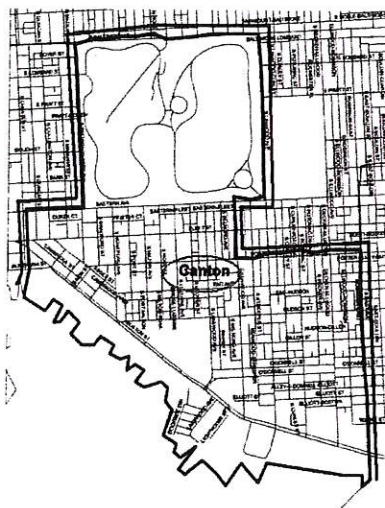


Figure T

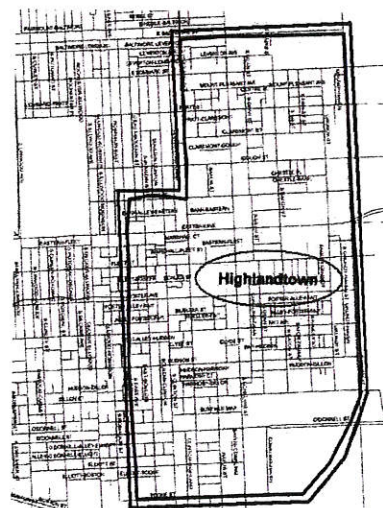


Figure U

The boundaries on the left side map resemble those of the yellow color-coded Patterson Park/Highlandtown (PPH) area used in this document's data analysis above. The remaining two maps encompass areas resembling the Canton/Brewers Hill (CBH) area indicated in the blue color code in our data analysis. Although the neighborhood boundaries vary slightly from those used in the census tract data analysis above, they are similar enough to portray information about the same general geographical areas.

The results for the seven major health outcomes shown in the table below:

	RANKS - out of the total of 55 city neighborhoods		
<u>HEALTH OUTCOMES</u>	Patterson Park N&E	Canton	Highland town
Infant mortality	17	6	4
Low Birthweight	21	19	20
Life Expectancy	35	7	17
Avertable Deaths	43	7	26
YPLL/10,000 residents	24	4	7
Injury (Accidents)	47	33	21
MORTALITY (all causes)	41	7	27

Note that both colors have been used in the right-hand table column above. This is to reflect that the delineation of the boundaries for Highlandtown in Figure U above also takes in the more affluent Brewers Hill area to the south of Eastern Avenue.

From this table, it is clear that the Patterson Park North & East neighborhoods have, by far, the poorest health outcomes in the SE Baltimore area. These neighborhoods are located almost entirely in the area which would be served by the Eastern Route being proposed here for the Patterson Park/Highlandtown (PPH) area.

It is also likely that PPH neighborhoods will benefit more the CBH neighborhoods in terms of beneficial health effects (increased physical activity, decreased obesity) resulting from transit-oriented development (TOD) around planned Red Line stations. Recent efforts to rewrite the Baltimore City Zoning Code speak directly about these benefits [Finding 5.3.3 - Zoning for a Healthy Baltimore, 2009-2010³⁸].

It has been argued that transportation policy should both support positive health outcomes and minimize negative impacts. To do this, such policy must "explicitly address the needs of disadvantaged groups" [at pages 2 and 3, "Health, Equity, and the Gresham Transportation System Plan" Upstream Public Health, 2011³⁹] The PPH area is host to many more such groups than the CBH area. It is within the PPH area that Southeast Baltimore has the majority of its health equity needs.

The six Transportation Health Equity Principles⁴⁰ which are cited by Upstream Public Health also help to make the Case for Eastern Avenue. These are:

- 1) ***Ensure equal access to essential goods and services, jobs and economic opportunities, and healthy foods and places.*** The PPH area depends more on public transportation to get to employment and to food stores.
- 2) ***Engage and empower impacted communities early and often, with opportunities to have real influence during all stages of decision-making.*** More active past outreach to residents of the PPH area could have influenced a different location for Red Line stations in Southeast Baltimore.
- 3) ***Implement transportation funding and investment policies that address***

- historical disinvestment for impacted persons and for underserved neighborhoods.* Parts of neighborhoods east and north of Patterson Park fit this description.
- 4) *Promote access to jobs, including in the transportation sector.* More of the unemployed residents in the PPH area need and would benefit from such jobs than residents of the CBH area.
 - 5) *Prioritize transportation investments that ensure healthy and safe communities.* Persons living in the PPH area are more likely to avail themselves of public transportation and the health benefits, such as increased walking.
 - 6) *Adopt transportation policies that promote environmental justice and sustainability.* More residents in the PPH area meet the environmental justice threshold. As a policy, sustainability applies equally in both the PPH and CBH areas.

"The Red Line Transit Project Health Impact Assessment" by Anna Ricklin was published in December 2008. It made many of the same points about health benefits which can be found above. The results of its Baseline Health Assessment (on pages 6-11) for neighborhoods within the Red Line Corridor generally resembled those reported above from the December 2011 Health Profiles published by the Baltimore City Health Department.

4) Eastern Avenue - A Fairer Route with More Productive Stations

a) STREET-LEVEL (SURFACE) ROUTE - along Eastern Avenue

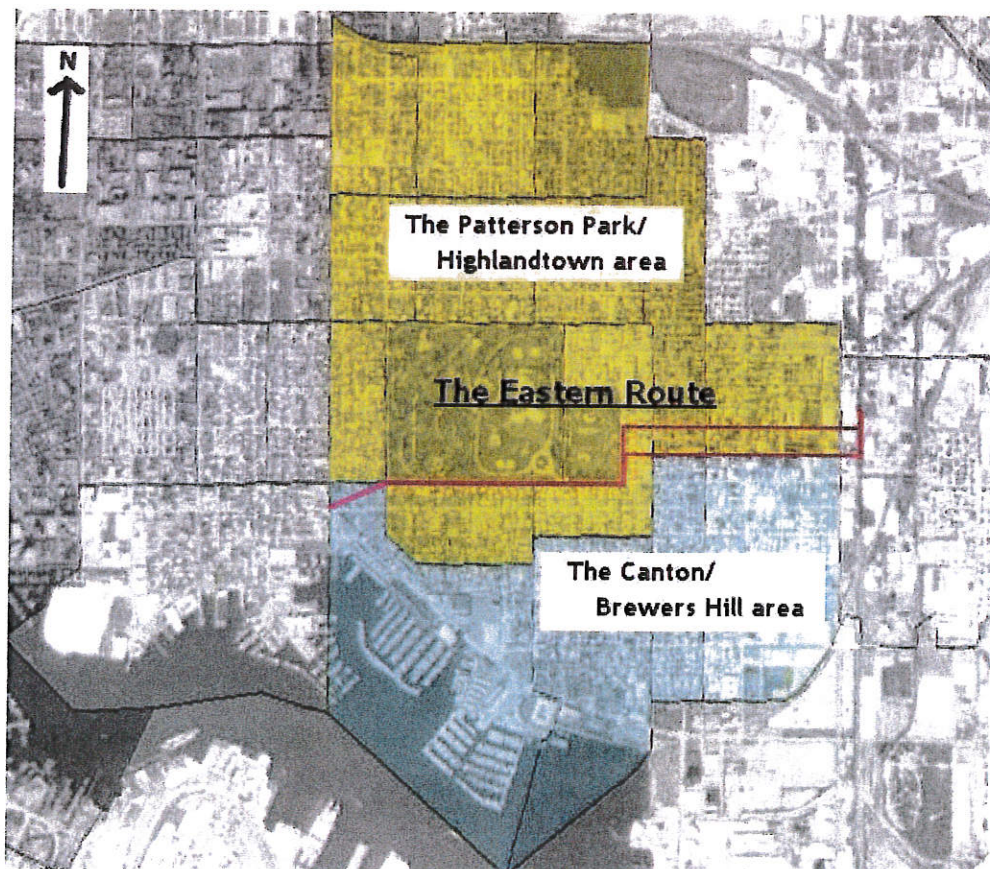


Figure V-1

These streets for the proposed surface route look like this today.

First, Eastern Avenue south of Patterson Park, looking east and west, respectively:



Photo 1



Photo 2

Second, here is Bank Street, looking east from Patterson Park:

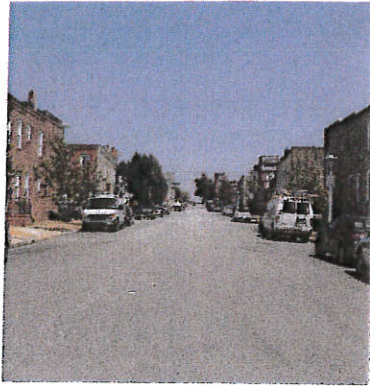


Photo 3

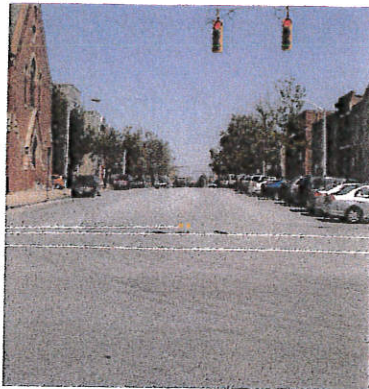


Photo 4



Photo 5

Third, here is Gough Street, looking west from Haven Street:

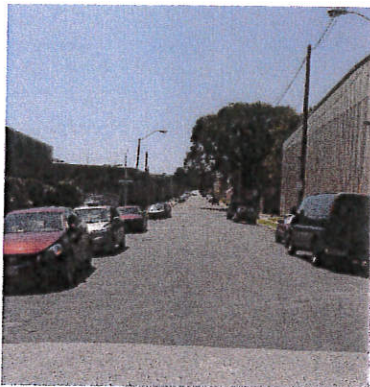


Photo 6

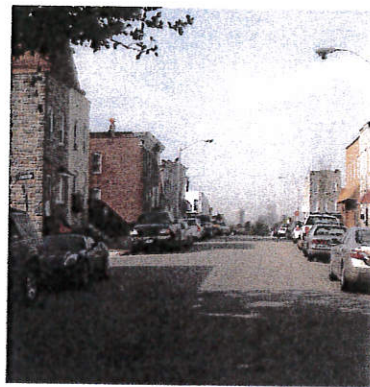


Photo 7

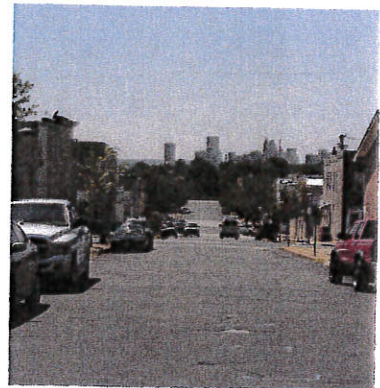


Photo 8

This Eastern Avenue Route, all at street level (surface), with its new stations, would look as follows:

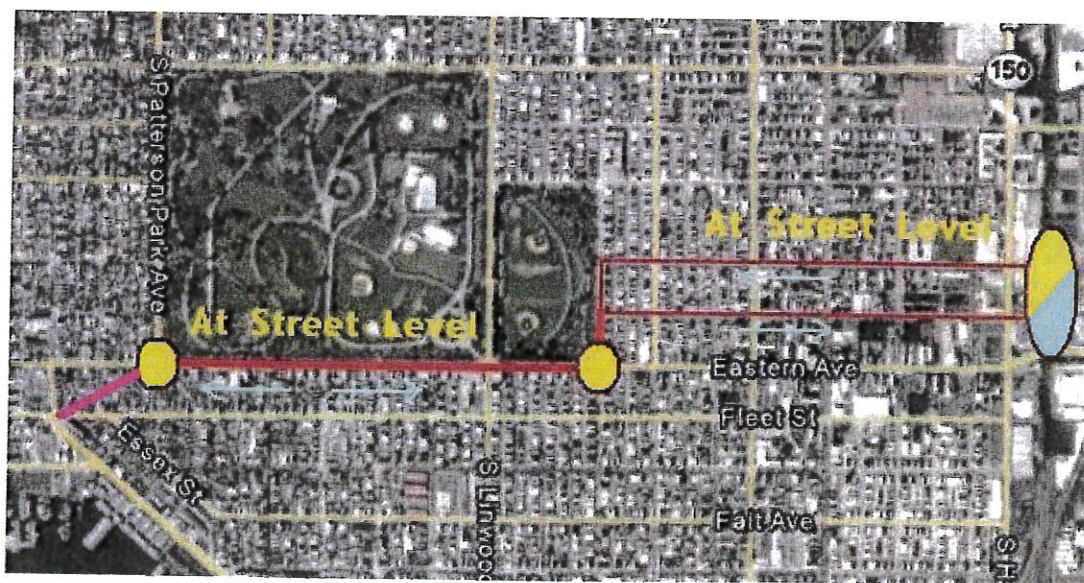
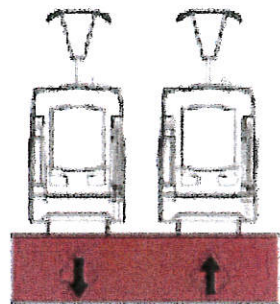


Figure V-2 [repeat of Fig. G at page 9 above]

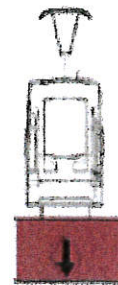
Here is what a cross section of these streets might look like with the rail lines at grade on the surface:



23'-0"

TRANSIT

Figure W-1



12'-0"

TRANSIT

Figure W-2

First, with rail proceeding both eastward and westward along the south edge of Patterson Park adjacent to Eastern Avenue, and north and south along the east edge of Patterson Park, adjacent to Ellwood Avenue (from Eastern Avenue to Bank Street). This rail line would be constructed in the area currently used for sidewalk at the south and east sides of the Park.

Then, eastward along Bank Street to the Highlandtown/Greektown Station, and back from that Station westward along Gough Street, and south along the west side of Ellwood Avenue (from Gough Street to Bank Street). [See the plan view in Fig. X directly below.]

[The source for the two graphic images above is the MTA's 2008 AA/DEIS, page 225.]

The reason for not continuing at street level on Eastern Avenue through Highlandtown is that in that location, the avenue is already highly commercial and highly trafficked, and it would be too disruptive both to construct and to run a double track along Eastern Avenue on the surface eastward through Highlandtown from Ellwood for the twelve blocks to Haven Street.

On the other hand, Bank and Gough Streets are residential, not commercial, and not especially heavily trafficked. As a result, they present suitable routes for a single track couplet (one track on each of the streets) with the eastbound track on Bank Street and the westbound track on Gough Street. In so doing, they would enable a surface light-rail vehicle to avoid causing the many problems for on-street parking and bi-directional traffic flow which were predicted with the 4A surface line originally planned as a couplet along Eastern Avenue and Fleet Street [Neighborhood Effects Technical Report, "#43 Highlandtown," at pages 163-164].

In a plan view, the direction changes on the Eastern Avenue rail lines might look like this:

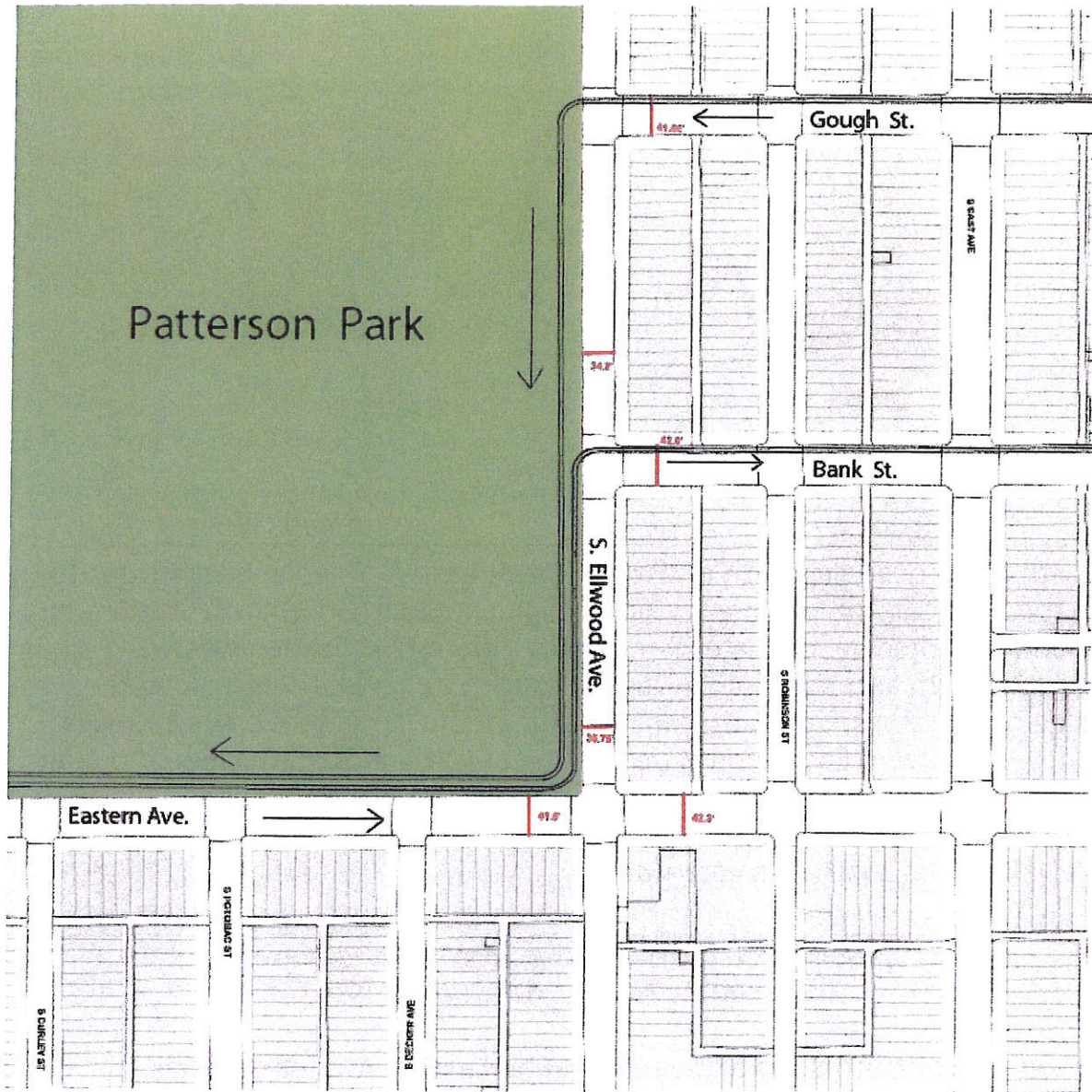


Figure X

[base map obtained from Baltimore City Dept. of Planning⁴¹]

b) Proximity to Patterson Park - The Draft Section 4(f) Evaluation

Quoting again from the June 15, 2010 letter from Henry Kay, MTA's Executive Director of Transit Development (discussed previously at pages 15-17 above):

3. I understand your alternative proposal to run the Red Line along the edge of Patterson Park...[T]o construct a rail line in Patterson Park would be very challenging under federal law which discourages the use of park land for transportation projects when there is a feasible alternative. I also doubt very much the community and park advocates would support this option.

Yet, the route location along Eastern Avenue on the south side of Patterson park which is suggested now in this advocacy document is similar to that proposed in 2008 by the MTA itself in AA/DEIS for Alternatives 4A, 3A, 3E, and 3F. So, one is left wondering about the basis for the objections raised by Henry Kay in the above letter.

The "Red Line Corridor Study: Draft Section 4(f) Evaluation" is completely silent about the proposed light rail lines along Eastern Avenue to the south of Patterson Park. As for the station [apparently a reference to the one near Chester Street - with a location similar to what is being proposed here for one of the two stations], the Evaluation states at page IV-5 that "[t]he surface station and tunnel head house locations ...have potential physical impacts to Patterson Park property. ... [However] [t]he location of either the surface station or tunnel head house will not impede access to the park or affect the overall functions of the park. It will benefit park users by providing direct access to the park.

On page VII-2, the Evaluation goes on to state that:

There are no prudent or feasible options to avoid potential impacts to Patterson Park. The impacts associated with all of the alternatives result from the proposed locations of either surface stations or tunnel head houses. The proposed locations for these structures within Patterson Park itself would not impact any of the individual contributing resources that exist within the park boundaries. It is anticipated that these potential 4(f) impacts will be considered *de minimis*.

In light of the above Draft 4(f) Evaluation, it is reasonable to conclude that the proximity of these proposals to Patterson Park - either surface (discussed above) or tunnel (discussed directly below) - would not present an obstacle to the station locations proposed near the southwestern and southeastern corners of the Park.

c) **THE TUNNEL ROUTE - under Eastern Avenue**

What if, instead of surface rail east of Chester Street, enough funding became available to extend the Fells Point Tunnel eastward all the way to the area planned for Station #18 just east of Haven Street? In that situation, the Eastern Route, now all underground, would look like this:

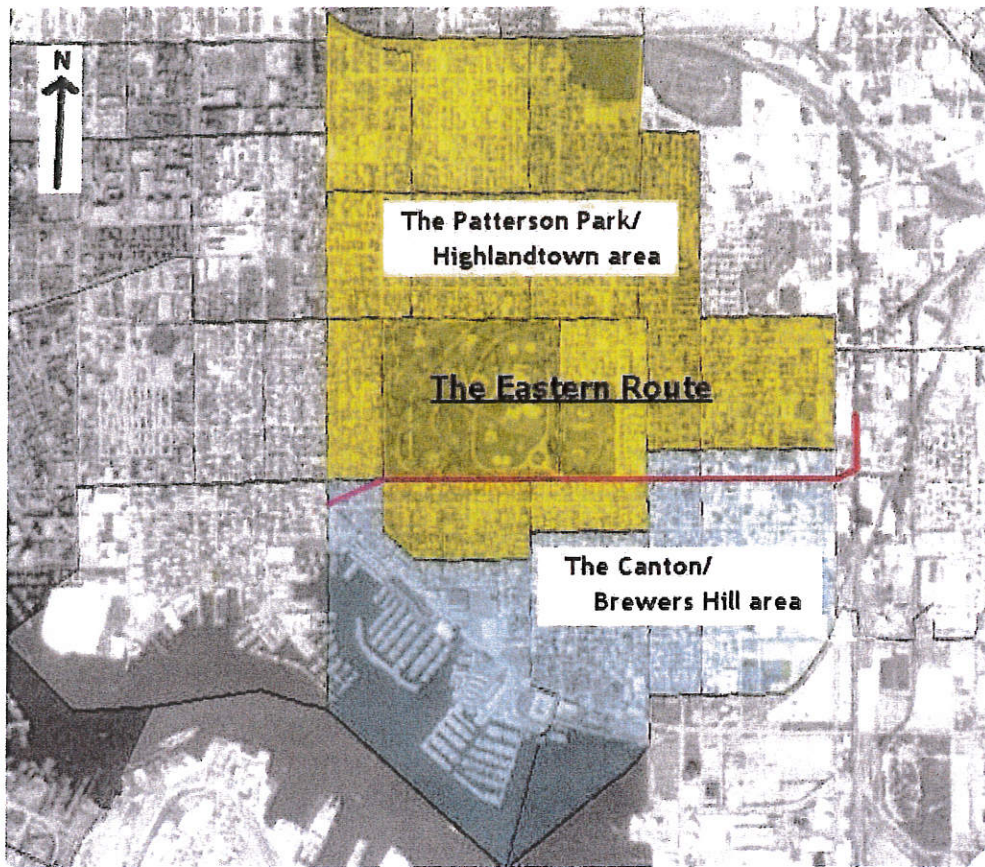


Figure Y-1

As stated in the AA/DEIS, on page 226, when discussing travel time savings with the alternatives proposed for Geographic Area 8 through Southeast Baltimore, "The greatest travel time savings are with the tunnel options."

Remarks about the advantage of tunneling are made throughout Volume 1 of the AA-DEIS:

...the faster times of the alternatives with the longer lengths of tunnel show the greatest gain in ridership [page 47]. For each mode,...the operating costs increase as more service is operated to meet the higher passenger demand attracted to the faster service provided by longer lengths of tunnel [page 105]. ...grade separation causes service to improve and ridership to increase...[page 117]. More tunneling ... yields higher user benefit hours [page 119]. ...an additional benefit of using tunneling to construct the Red Line: fewer parking spaces would be lost [page 120].

This Eastern Avenue Route, all in tunnel, with its new stations would look as follows:

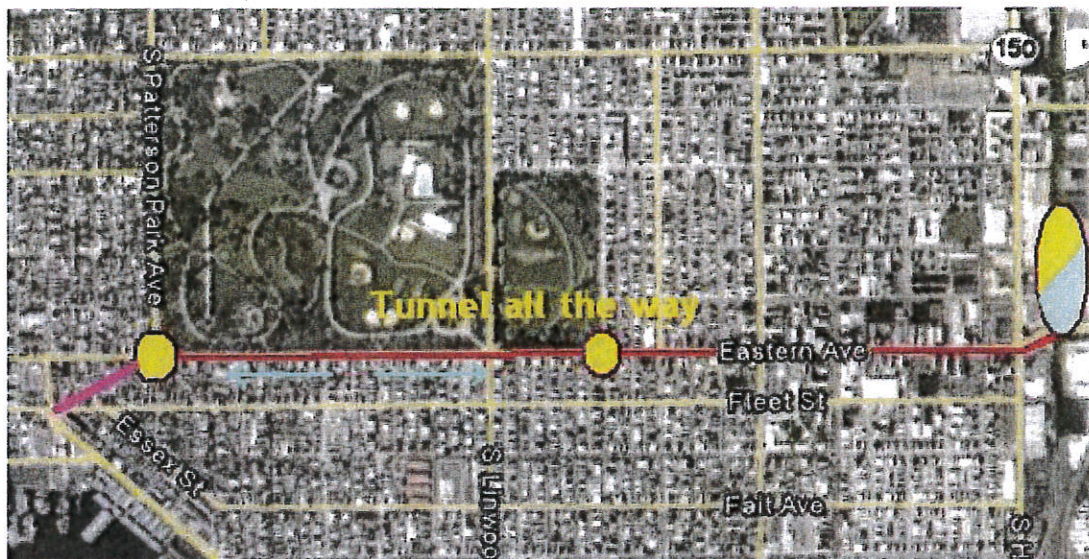


Figure Y-2 [repeat of Fig. H at page 10 above]

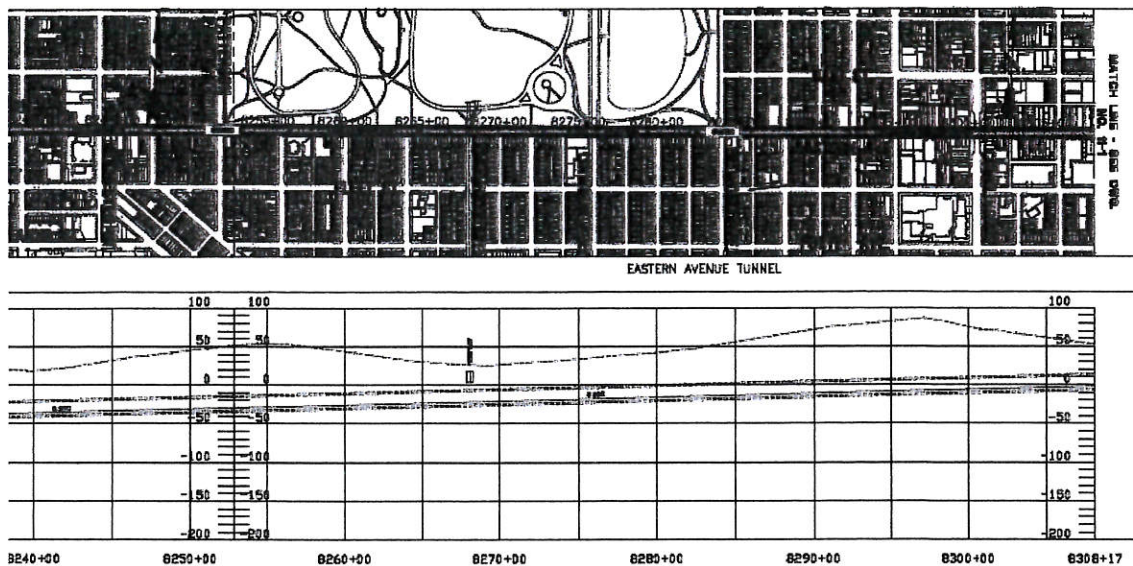


Figure Y-3

Figure Y-3 above is a version of the east end of Profile 9-1 attached to all of Profile 10-1 (April 2008) prepared for the Eastern Avenue Tunnel, and modified here as to station placement by the author of this report. [The Profiles were developed as part of the AA/DEIS Alternatives Technical Report.]

Figure Z directly below was first seen on page 10 above (and also in the Executive Summary). It shows the change in stations which would result from choosing the recommended Eastern Route, whether surface or tunnel, over the currently proposed Canton Route.

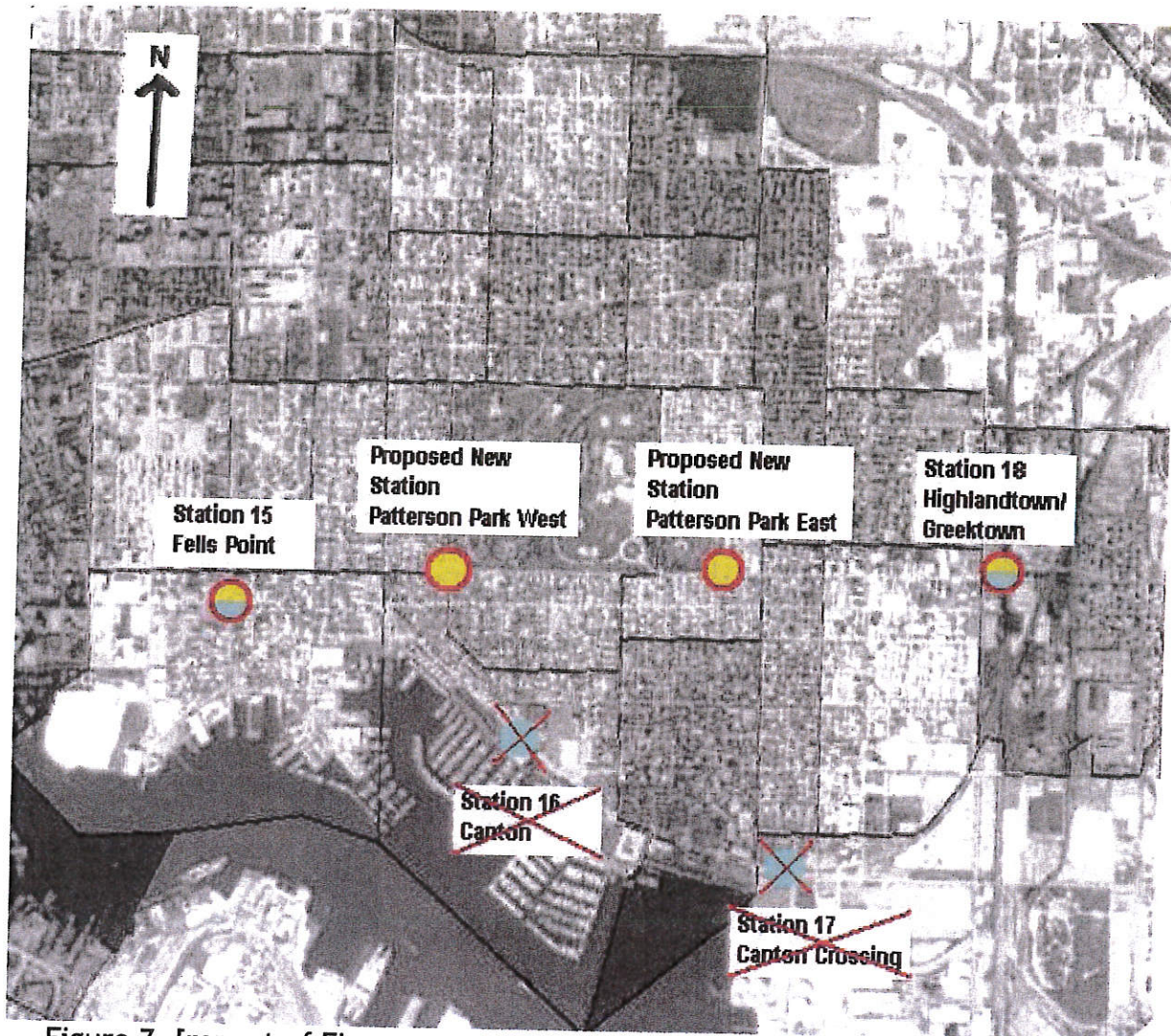


Figure Z [repeat of Fig. I at page 10 above, and from the Executive Summary]

d) Costing Out Eastern Avenue

A most important consideration in all of this is paying for it. The major source for cost figures for the Red Line is the Capital Cost Technical Report of the AA/DEIS, which was issued in January 2008. This report lays out the details for each of the eleven alternate Red Line routes. Route 4C was selected as the Locally Preferred Alternative (LPA) in August 2009. It is likely that the costs initially projected for 4C back in 2007-2008 have changed and been adjusted with the passage of time and the discovery of unanticipated cost generators. However, the itemized, detailed charts represent the best public information about cost that is currently available for our use [Source: Capital Cost Technical Report].

It is possible to develop an estimated cost for both the surface route and tunnel route proposed here by selecting specific cost categories from the detailed charts for light rail alternatives 4A, 4C and 4D. 4A represents a surface route which follows Eastern Avenue. 4D represents a tunnel route which follows Eastern Avenue. And, of

course, 4C is the surface route along Boston Street through Canton and Brewers Hill, which resembles the Locally Preferred Alternative (LPA) selected in 2009.

The principal category which enables a cost comparison of the Eastern Avenue surface route proposed here with 4C (the LPA) is Category 10 "Guideway and Track Elements." The costs are derived from alternatives 4A and 4C. The 4A surface route included Fleet Street along with Eastern Avenue, while we are proposing a double track only along Eastern Avenue, with single-tracking in Highlandtown along Bank and Gough Streets. Thus, although different, the two surface variants are roughly comparable in terms of track lengths.

The method which enables a cost comparison between the Eastern Avenue tunnel route proposed here and 4C (the LPA) is the summing of the subtotals from all nine cost categories (10-Guideways and Track Elements; 20-Stations, Stops, Terminal, Intermodal; 30-Support Facilities: Yards, Shops, Admin. Buildings; 40-Sitework & Special Conditions; 50-Systems; 60-Row, Land, Existing Improvements; 70-Vehicles; 80-Professional Services; and 90-Unallocated Contingency). The costs are derived for alternatives 4D and 4C. 4D uses only tunnel. The costs are figured on that portion which passes through Geographic Areas (GA) 8 and 9. Because of a change that would be needed at the east end of the Fells Point Tunnel, Geographic Area 7 costs are included as well.

In comparing the costs of the two routes, using the 2008 amounts from the AA/DEIS Capital Cost Technical Report, the primary expenses are set out in the chart below:

	Entire Red Line Cost with Canton Route [4C]	Entire Red Line Cost with Eastern Route - SURFACE	Entire Red Line Cost with Eastern Route - TUNNEL
Total Cost:	\$1,630,810,000	\$1,590,550,000	\$1,943,120,000
Amount of difference from 4C:		-\$40,260,000	\$312,310,000
Percent of difference from 4C:		2.5% less	19.2% more

The savings resulting from the Eastern Avenue surface route would be due primarily to over 3000 feet less of track mileage necessary along Eastern Avenue, compared to Boston Street. The greater expense of the tunnel route would be due to the cost of extending the Fells Point tunnel under Eastern Avenue, as compared to the cost of running the tracks on the surface along Boston Street.

Detailed documentation for these amounts may be found directly below.

— Prepared by b'more mobile – March 2012 —

Rummel, Klepper & Kahl, LLP

Alternate
Name: 4C

GA 8 GA 9

Alternate
Name: 4A

GA 8 GA 9

Category: 10 Guideway & Track Elements

- 10.01 Guideway: At-grade exclusive right-of-way
- 10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)
- 10.03 Guideway: At-grade in mixed traffic
- 10.04 Guideway: Aerial structure
- 10.06 Guideway: Underground cut & cover
- 10.07 Guideway: Underground tunnel
- 10.08 Guideway: Retained cut or fill
- 10.09 Track: Direct fixation
- 10.10 Track: Embedded
- 10.11 Track: Ballasted
- 10.12 Track: Special (switches, turnouts)
- 10.13 Track: Vibration and noise dampening

\$3.70	\$5.74	
		\$17.63
\$9.71		
\$25.41		
\$5.16	\$1.99	
\$1.67	\$2.26	
\$6.35		
	\$6.84	
\$1.22	\$1.14	Sum of
	\$0.38	GA 8 + 9:

\$6.55	\$5.09	
		\$0.03
		\$17.63
	\$1.99	
	\$2.26	
\$7.25	\$2.06	
	\$4.30	
	\$1.53	Sum of
	\$0.25	GA 8 + 9:

COMPARED TO
4C:

Millions of \$ LESS
for
Eastern Avenue
On the Surface

Subtotal Category

\$53.22 \$35.97 \$89.19

\$13.80 \$35.13 \$48.93

-\$40.26

Rummel, Klepper & Kahl, LLP

Alternate
Name: 4C

GA 7 GA 8 GA 9

Alternate
Name: 4D

GA 7 GA 8 GA 9

Category: 10 Guideway & Track Elements

- 10.01 Guideway: At-grade exclusive right-of-way
- 10.04 Guideway: Aerial structure
- 10.06 Guideway: Underground cut & cover
- 10.07 Guideway: Underground tunnel
- 10.08 Guideway: Retained cut or fill
- 10.09 Track: Direct fixation
- 10.10 Track: Embedded
- 10.11 Track: Ballasted
- 10.12 Track: Special (switches, turnouts)
- 10.13 Track: Vibration and noise dampening

\$3.70	\$5.74	
		\$17.63
\$9.71		
\$77.03	\$25.41	
\$5.16	\$1.99	
\$1.67	\$2.26	
\$6.35		
	\$6.84	
\$1.22	\$1.14	
	\$0.38	

		\$2.22
		\$17.63
\$21.70		\$9.14
\$72.16	\$134.53	\$33.36
		\$10.18
\$3.44	\$6.31	\$3.87
		\$3.89
\$0.63		\$1.00
		\$0.21

Subtotal Category

\$80.62 \$53.22 \$35.97

\$97.92 \$140.84 \$81.52

Category: 20 Stations, Stops, Terminals, Intermodal

- 20.01 At-grade station, stop, shelter, mall, terminal, platform
- 20.03 Underground station, stop, shelter, mall, terminal, platform
- 20.07 Elevators, escalators

\$2.18	\$3.28	
\$55.40		
\$2.60	\$0.40	

		\$2.18
\$83.11	\$55.40	
\$3.90	\$2.60	

Subtotal Category

\$58.01 \$2.18 \$3.68

\$87.01 \$58.01 \$2.18

Category: 30 Support Facilities: Yards, Shops, Admin Bldgs

- 30.03 Heavy Maintenance Facility

Subtotal Category

Category: 40 Sitework & Special Conditions

- 40.01 Demolition, Clearing, Earthwork
- 40.02 Site Utilities, Utility Relocation
- 40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments
- 40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks
- 40.05 Site structures including retaining walls, sound walls
- 40.06 Pedestrian / bike access and accommodation, landscaping
- 40.07 Automobile, bus, van accessways including roads, parking lots
- 40.08 Temporary Facilities and other indirect costs during construction

\$0.65	\$1.72	
\$1.17	\$1.44	
\$0.35	\$0.93	
\$0.36	\$0.96	
\$0.00	\$0.23	\$0.60
\$3.19	\$4.93	\$0.04
\$0.00	\$0.00	\$0.00

		\$1.32
\$0.21		\$0.93
		\$0.71
		\$0.74
\$6.30	\$0.00	\$0.46
\$1.72	\$1.26	\$0.71
\$0.00	\$0.00	\$0.00

Subtotal Category

\$3.19 \$7.69 \$5.69

\$8.23 \$1.26 \$4.88

Category: 50 Systems

- 50.01 Train control and signals
- 50.02 Traffic signals and crossing protection
- 50.03 Traction power supply: substations
- 50.04 Traction power distribution: catenary and third rail
- 50.05 Communications
- 50.06 Fare collection system and equipment

\$1.24	\$2.56	\$4.89
	\$1.12	\$1.59
\$1.15	\$2.17	\$4.34
\$0.74	\$1.00	\$1.78
\$0.53	\$0.53	\$0.80

\$1.42	\$2.17	\$3.81
		\$0.82
\$1.10	\$2.02	\$3.33
\$0.95	\$0.97	\$1.30
\$0.80	\$0.53	\$0.53

Subtotal Category

\$3.66 \$7.39 \$13.41

\$4.27 \$5.69 \$9.79

Category: 60 Row, Land, Existing Improvements

- 60.01 Purchase or lease of real estate

\$0.00 \$0.00 \$0.00

\$0.00 \$0.00 \$0.00

Subtotal Category

\$0.00 \$0.00 \$0.00

\$0.00 \$0.00 \$0.00

Category: 70 Vehicles

- 70.01 Vehicles

Subtotal Category

Category: 80 Professional Services

- 80.01 Preliminary Engineering
- 80.02 Final Design
- 80.03 Project Management for Design and Construction
- 80.04 Construction Administration & Management
- 80.05 Insurance
- 80.06 Legal; Permits; Review Fees by other agencies, cities, etc.
- 80.07 Surveys, Testing, Investigation, Inspection
- 80.08 Start up

\$5.82	\$2.82	\$2.35
\$8.73	\$4.23	\$3.53
\$7.27	\$3.52	\$2.94
\$11.64	\$5.64	\$4.70
\$2.91	\$1.41	\$1.18
\$4.36	\$2.11	\$1.76
\$4.36	\$2.11	\$1.76
\$1.45	\$0.70	\$0.59

\$7.90	\$8.23	\$3.93
\$11.85	\$12.35	\$5.90
\$9.87	\$10.29	\$4.92
\$15.80	\$16.46	\$7.87
\$3.95	\$4.12	\$1.97
\$5.92	\$6.17	\$2.95
\$5.92	\$6.17	\$2.95
\$1.97	\$2.06	\$0.98

Subtotal Category

\$46.55 \$22.55 \$18.80

\$63.18 \$65.86 \$31.48

Category: 90 Unallocated Contingency

- 90.01 Unallocated Contingency
- 90.02 Unallocated Contingency (Categories 10-50)
- 90.03 Unallocated Contingency (Categories 60-80)

\$0.00	\$0.00	\$0.00
\$7.27	\$3.52	\$2.94
\$0.93	\$0.45	\$0.38

\$0.00	\$0.00	\$0.00
\$9.87	\$10.29	\$4.92
\$1.26	\$1.32	\$0.63

Subtotal Category

\$8.20 \$3.98 \$3.31

\$11.14 \$11.61 \$5.55

Alternate Totals

\$200.24 \$97.01 \$80.86 \$378.11

\$271.76 \$283.26 \$135.40 \$690.42

COMPARED TO
4C:

Millions of \$ MORE
for an
Eastern Avenue
Tunnel

\$312.31

To quote from the AA/DEIS - Chapter 6 - page 122:

BRT Alternatives

Based upon the financial analysis that is predicated upon achievable levels of funding, both federal as well as non-federal, it would be very difficult to finance an alternative costing more than \$2 billion. Thus BRT Alternative 3D [maximum tunnel] may not be financially achievable.

...

LRT Alternatives

LRT Alternative 4D [maximum tunnel] may not be financially achievable for the same reason as Alternative 3D.

However, the tunnel alternative (although it resembles 4D) totals out at \$1,943,120,000 - considerably less than 4D [\$520 million less] because it does not include a tunnel which was planned as part of Alternative 4D to go under the Edmondson and Rosemont areas. This would probably give it a lower (that is, more favorable) cost-effectiveness index than the 4D alternative. That index is calculated by taking the Equivalent Annual Capital Costs Above the Transportation Service Management alternative (TSM), adding it to the Net change in Operating Cost Above TSM, and dividing that sum by the number of Annual Benefit Hours. It is not possible for us to calibrate here the exact change in cost effectiveness between this tunnel alternative and Alternative 4D because we have no rigorous way to establish these Capital and Operating Cost figures or the Benefit Hours.

Despite the greater costs, there are definite advantages to running the Red Line in a tunnel in Southeast Baltimore. According to the Capital Cost Technical Report of the AA/DEIS, tunnels have a lifetime of 125 years, and their track has a lifetime of 30 years. Surface tracks, on the other hand, have a 20-year lifetime. Underground stations last considerably longer than surface stations (125 as against 70 years), and because they are not exposed to the street, also require less maintenance. Therefore, it is arguable that the heavier costs incurred in constructing tunnels and underground stations would be, at least to some extent, offset by these longer lifetimes and the reduced maintenance. In other words, tunnel replacement and upkeep costs would be lower than similar costs for surface lines.

Furthermore, there would be some transportation and neighborhood impact advantages to tunnels over surface operation. Tunnels would avoid interference and reduce considerably the safety issues with pedestrian and vehicular traffic. They would transmit less train noise to the surrounding areas. Since the trains would not be visible on the surface, they would also interfere much less with sight lines and surface aesthetics. See page 51 above for explicit references to tunnel advantages as stated in the AA/DEIS.

e) ***What It Will Take to Replace the Canton Route with the Eastern Avenue Route - A Call to Action!***

The Case for Eastern Avenue, as stated above, is based upon environmental justice, economic development, transit service equity, and health equity. It all comes down to relative numbers of transit-dependent and other persons who will be served by the Red Line in Southeast Baltimore - using two stations and a route going along Eastern Avenue rather than, as currently planned, along Boston Street.

i) ***The Role of Government***

--- Actions Requested

The MTA is currently engaged in obtaining the necessary federal approvals and go-aheads as it proceeds with the planning of the Red Line. In light of the presentation made above, it is requested that Governor Martin O'Malley and the MTA choose the Eastern Avenue route over the Canton route between Fells Point (Station #15) and the Highlandtown/Greektown Station (Station #18). In so doing, the choice should be between either:

- a) the street-level (surface) alignment which runs along Eastern Avenue south of Patterson Park, and then north on the west side of Ellwood to a couplet through Highlandtown on Bank and Gough Streets; or
- b) the tunnel alignment under Eastern Avenue.

Option a) resembles but is not identical to the Geographic Areas 8 and 9 alignments proposed in 2008 as Alternative 4A. Option b) is an identical alignment to the proposed Alternative 4D, insofar as it applies to the Eastern Avenue portion of the Red Line, except with a variation in station location.

In order for this change to take place, support will be needed from Maryland's Congressional delegation (Senator Barbara Mikulski, Senator Ben Cardin, and Representatives John Sarbanes and Elijah Cummings for Southeast and East Baltimore, respectively); State Senator William Ferguson and Delegates Luke Clippinger, Peter Hammen and Brian McHale from Legislative District 46 which includes Southeast Baltimore; and the Mayor and City Council of Baltimore City. The change will also need ratification by the Baltimore Metropolitan Council and programmatic assistance from the Baltimore City Department of Transportation.

ii) ***The Role of the Communities Around Patterson Park and in Southeast Baltimore***

The many years of planning the Red Line have not included a broad, united, and

representative coalition of community interests advocating for the best routing of the Red Line. Efforts by the MTA to involve the public are described below.

As stated in Chapter 7 of the AA/DEIS, prior to the September 2008 publication of the AA/DEIS ("Public Input and Agency Coordination"), there was a series of meetings held to obtain public "input." The public input process - conducted by the Maryland MTA - consisted of five scoping meetings (2003), seventeen public open houses (2004, 2005, and 2007), and ten community workshops (2005 and 2006). In 2005, a 15-member Red Line Citizens Advisory Council (CAC) was created by the Maryland General Assembly. The CAC held seven meetings during 2007 and 2008.

The MTA has paid attention to public relations. There is a community outreach staff. The position of Red Line Coordinator for the City of Baltimore was filled in January 2008. "The Red Line Community Compact" was signed in September 2008, the same month the voluminous AA/DEIS was being published (which raises a question about how informed the signatories could be at the time). In November 2008, a series of four formal public hearings was held on the AA/DEIS. Baltimore City held a Mayor's Summit on the Red Line in May 2009. Around the same time, the MTA created and has kept current an extensive website www.baltimorelined.com. In July 2009, a charrette was held on transit-oriented development with representatives of the Southeast Community Development Corporation (CDC) and the Greektown Community Development Corporation. The focus of this charrette was on development in the eastern side of Highlandtown around the planned Red Line Station #18 (Highlandtown/Greektown). The city also created its own Baltimore Red Line website in 2009. In 2010, five Community Liaisons were hired, along with several Community Liaison Assistants. 17 Station Area Advisory Committees (SAACs) were formed around the selected route (Locally Preferred Alternative). The SAACs have been holding bi-monthly meetings ever since. There also were four SAAC open houses in May 2011. The Red Line Citizens Advisory Council has met each month. In October 2011, a special meeting was held about the Canton Station (#16), and in February, 2012, there was a special meeting held on changes involving the Red Line configuration near the Social Security Administration on the west side, next to I-70.

Members of the general public have been invited and encouraged by the Maryland MTA to provide public input and ask questions at the above meetings, as well as to testify at the formal public hearings in November 2008. However, the initiative for this engagement has generally "come from outside and above" - from the State and local transportation agencies (and very few other government agencies). Most of the routes and stations have been developed initially by the transportation planners and presented to the public for reaction. So, the choice of stations and routes has been made with partial public participation, at best. The process was not conducted as openly as it might have been with full involvement of the public from the beginning - that is, before a route or station location had been developed. A similar "top-down" process was used in the 2001-2002 development of the Baltimore

Region Rail System Plan, which preceded and led to the Baltimore Red Line planning process being discussed here. There has not yet been in Baltimore City or Baltimore County a significant grassroots community coalition formed to influence the planning of the Red Line. This is a serious shortcoming, given the fact that the Red Line is our metropolitan area's premier public transportation project for the 21st Century. Decisions that are being made now about the location of its stations and route will have an effect on the future of the Baltimore Metropolitan area for many generations to come.

A major new report from the Transportation Research Board (TRB) points the way to increased community involvement ["Practical Approaches for Involving Traditionally Underserved Populations in Transportation Decisionmaking - NCHRP Report 710⁴²"], with examples of effective practices from around the US.

There are local organizations in and around Baltimore which have engaged in transportation advocacy - such as some neighborhood associations, the Central Maryland Transportation Alliance (CMTA), the Greater Baltimore Committee (GBC), the Citizens Planning and Housing Association (CPHA), the Transit Riders Action Council of Metropolitan Baltimore (TRAC), the CDCs mentioned above, the West Baltimore MARC TOD/Transportation Inc., the West Baltimore Coalition, and others. However, there has not yet been a grassroots community partnering of neighborhood and business associations across either part or all of the fourteen miles of the proposed Red Line to work together to help drive and steer the transportation planning significantly "from below."

Although there are undoubtedly people and public officials who might claim that such a true grassroots partnership is not necessary or even desirable for public transportation planning, experience in other metropolitan areas demonstrates the importance of such community-based initiative and efforts. Metro areas, such as Denver, CO, Portland, OR, and Minneapolis-St. Paul, MN, are all recent sites of active community-based public transportation planning. The existence of such grassroots partnerships and coalitions has helped to ensure that major public transportation improvements serve the residents of the neighborhoods through which they pass, and not simply the needs of suburban commuters.

The St. Paul and Minneapolis "Stops For Us" coalition composed of 34 groups offers us a strong example of this kind of transit coalition (see page 15 above and note 13 below). These groups include fourteen neighborhood-based councils or associations; the NAACP; Urban League; groups representing Asian, Hmong, and Jewish citizens; business, union, Model Cities, and community development groups; and transit and environmental advocacy groups.

This Case for Eastern Avenue must get the attention and hearing it deserves for the sake of the transportation future of minority (including Hispanic) and low-income

persons living in Southeast Baltimore today. A grassroots Red Line transit coalition of community residents, and of the cultural, educational, recreational, and economic interests directly affected in Southeast Baltimore must be formed. Working in a united manner to secure service equity and health equity for the residents living along Eastern Avenue, such a coalition could evolve into a partnership. A catchy name, such as "Equity for Eastern," could help with the organizing. The goal would be to ensure that those residents and business employees and customers who depend on and could benefit the most from public transportation get served, and not bypassed (as most of them would be if the Boston Street alignment is retained). Such a transit coalition could include, but not be limited to, such organizations as (listed alphabetically): Brewers Hill Community Association, Butchers Hill Association, Canton Community Association, Canton-Highlandtown Community Association (CHICA), CASA de Maryland, Creative Alliance, Education-Based Latino Outreach (EBLO), Friends of Patterson Park, Greektown Community Association, Greektown Community Development Corporation, Hampstead Hill Improvement Association, Highlandtown Arts & Entertainment District, Highlandtown Community Association, Highlandtown Merchants Association, Historic East Baltimore Community Action Coalition (HEBCAC), Latino Providers Network, Milton Avenue Community Association & Development Corporation, Neighbors of Brewers Hill, Patterson Park Neighborhood Association, Patterson Place, Inc. - A Community Taking Action, Red Line Now PAC, Southeast Community Development Corporation (SCDC), Southeast Presidents Council, and the Southeastern Improvement Association.

With a coalition composed of many or most of the above organizations, the outcome for stations and a route through Southeast Baltimore could be different. What is currently slated to go along Boston Street could be changed to Eastern Avenue, where it would serve many more transit riders. Had such a coalition existed as Red Line planning was beginning, the Case for Eastern Avenue would have been clearer to more people and groups, and this would have been more likely to influence the location of stations and route in Southeast Baltimore from the start. There still is time now to choose to run the Red Line along Eastern Avenue. That is the way to "do it right" in Southeast Baltimore.

* * *

BIBLIOGRAPHY OF SOURCES

[referenced by endnote number, and indicating all pages cited in text above]

#	SOURCE	Page
1	Healthy Baltimore 2015 (May 2011) - Baltimore City Health Department	1
2	"Social Determinants of Health – The Solid Facts" 2nd Edition, World Health Organization - 2003, pages 29-31	1

#	SOURCE	Page
22	Title VI of the Civil Rights Act of 1964	32
23	49 CFR Part 21- Nondiscrimination in Federally-Assisted Programs of the Department of Transportation -- Effectuation of Title VI of the Civil	32

3	"Follow the Red Line" - Urbanite Magazine - No. 88 - October 2011 - Page 41	1
4	Red Line Corridor Study Alternatives Analysis/Draft Environmental Impact Statement (AA/DEIS) with 19 Technical Reports and 33 Appendices and Profiles - http://www.baltimoreredline.com/archives/archives-documents	2 - and cited many times in text
5	"Technical Report On the Baltimore Region Rail System Plan" (August 2002) including 18 Appendices	3-4, 32, 58
6	Locally Preferred Alternative (LPA) Descriptive Statement on Baltimore Red Line web site - www.baltimoreredline.com	5-7, 14, 15-16, 35, 53-54
7	Station Area Advisory Committee (SAAC) #16 - Canton - Minutes - www.baltimoreredline.com/station-area-advisory-committees	7, 14, 58
8	Station Area Advisory Committee (SAAC) #17 - Canton Crossing - Minutes - www.baltimoreredline.com/station-area-advisory-committees	7, 58
9	Vision Plan #16 - for Canton Station - Station Area Advisory Committees - November 1, 2011 - www.baltimoreredline.com/station-area-advisory-committees	7
10	Vision Plan #17- for Canton Crossing Station - Station Area Advisory Committees - November 1, 2011	7
11	"Location Map of Railroad Sidings and Industrial Tracks in Baltimore" (1948) compiled by Industrial Bureau, Baltimore Association of Commerce	8
12	US Department of Transportation Report on "Baltimore's Railroad Network" (2011) - inset from Figure 2-13 on page 2-10	8
13	"Stops for Us - Organizing for Equity along the Central Corridor" http://dccstpaul-mpls.org/content/stops-us-booklet	15, 59, 60
14	Exchange of correspondence between Henry Kay, MTA, and Art Cohen, <i>b'more mobile</i> - June 11, June 15, and August 30, 2010	15-17, 49

	Rights Act of 1964	
24	FTA Circular 4702.1A (2007) - Title VI and Title VI-Dependent Guidelines for Federal Transit Administration Recipients	32
25	2000 US Census - disability data obtained from the Maryland State Data Center	34
26	Housing and Transportation Affordability Index - Center for Neighborhood Technology, 2010	34
27	Baltimore Metropolitan Council - Cooperative Forecasting Process - Round 7-B (2009 update) and Round 7-C (2010 update)	35
28	Council on Environmental Quality - "Environmental Justice - Guidance Under the National Environmental Policy Act" (1997)	36
29	Major Capital Investment Projects ("New Starts" and "Small Starts") - Docket No. FTA-2010-0009 - 49 CFR Part 611	40
30	"Canton Crossing retail site sold to Baltimore development team" - Baltimore Business Journal - June 7, 2011	40-41
31	"Canton Crossing site sold to BCP Investors" - Daily Record - June 7, 2011	40-41
32	"Retail center planned for Exxon Mobil site in Canton" - Baltimore Sun - June 8, 2011	40
33	"Retail Development Heats Up in Baltimore" - Baltimore Sun - December 6, 2011	40
34	Litman, Todd "Evaluating Public Transportation Health Benefits," Victoria Transport Policy Institute - For the American Public Transportation Association - June 14, 2010	41-42
35	"Baltimore targets 'food deserts'" - Baltimore Sun - March 5, 2012	42

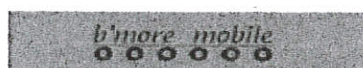
15	"New Starts" law – 49 USC s. 5309 (d)(3)(G) and (H)	15, 17, 39, 40	36	"Journey through the Desert" - Urbanite - No. 94 - April 2012 - page 33	43
16	Parsons Brinckerhoff – Cell #10 from PB27 Transit Demand Forecasting Model	17, 20	37	2011 Baltimore City Neighborhood Health Profiles for Patterson Park N & E; Canton; Highlandtown - Baltimore City Health Department	43-44
17	Fehr & Peers "Direct Ridership Forecasting" - www.fehrandpeers.com/docs/0805DirectRidershipForecastingWeb.pdf	17-18	38	"Zoning for a Healthy Baltimore - A Health Impact Assessment of the Transform Baltimore Comprehensive Zoning Code Rewrite" (2009-2010)	44
18	2010 Demographic Profiles [race, ethnicity], US Census Bureau - accessible at Maryland State Data Center - http://www.mdp.state.md.us/msdc/	15, 18, 21-23, 25, 27, 29, 31, 33	39	Guenin, Heidi and Lund, Darin "Health, Equity, and the Gresham Transportation System Plan" (January 12, 2011), Upstream Public Health, Portland, OR	44
19	2006-2010 American Community Survey (ACS), US Census Bureau [economic, social, housing, and demographic profiles] http://www.mdp.state.md.us/msdc/	15, 23, 25, 27, 29, 31, 33	40	"Transportation Health Equity Principles" (2011). Upstream Public Health, Portland, OR	44-45
20	Executive Order 12898 (1994) - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations	32	41	Base map for southeastern corner of Patterson Park – Baltimore City Department of Planning (2011)	49
21	US Department of Transportation Order (5610.2) to Address Environmental Justice in Minority Populations and Low-Income Populations	32	42	"Practical Approaches for Involving Traditionally Underserved Populations in Transportation Decisionmaking" - NCHRP Report 710 - Center for Environmental Excellence by AASTHO, Transportation Research Board - March 27, 2012	59

ACKNOWLEDGMENTS

The author gratefully acknowledges the help and support provided by various planners, information specialists, and community organizers and advocates from around the City and Metropolitan Area of Baltimore; transportation agency staff members; and friends and family.

* * *

Please address all inquiries and comments to:



Art Cohen, Convenor

b'more mobile

Website: www.bmoremobile.org

Based in Baltimore, Maryland

E-Mail: artc12health@yahoo.com